STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

Request For Bids For Construction Services

Two-Stage Bidding Process

Stage II – General Contractor's Bidding List
Invitation to Bid
REVISED

September 8, 2005

TANK REPLACEMENT
SPRINGVILLE FISH HATCHERY

DIVISION OF WILDLIFE RESOURCES
SPRINGVILLE, UTAH

DFCM Project No. 05123520

J-U-B Engineers

TABLE OF CONTENTS

Current copies of the following documents are hereby made part of these contract documents by reference. These documents are available on the DFCM web site at http://dfcm.utah.gov or are available upon request from DFCM:

DFCM General Conditions dated May 25, 2005
DFCM Application and Certificate for Payment dated May 25, 2005

Technical Specifications:
Drawings:

The Agreement and General Conditions dated May 25, 2005 have been updated from versions that were formally adopted and in use prior to this date. The changes made to the General Conditions are identified in a document entitled Revisions to General Conditions that is available on DFCM's web site at http://dfcm.utah.gov

INVITATION TO BID - REVISED

ONLY CONTRACTORS PREVIOUSLY SHORT-LISTED DURING STAGE I

The State of Utah - Division of Facilities Construction and Management (DFCM) is requesting bids for the construction of the following project:

TANK REPLACEMENT – SPRINGVILLE FISH HATCHERY
DIVISION OF WILDLIFE RESOURCES – SPRINGVILLE, UTAH
DFCM PROJECT NO.: 05123520

Install new fry tanks. Make repairs and alterations according to the construction documents.
Construction cost estimate: $167,000

FIRM NAME	POINT OF CONTACT	PHONE	FAX
ABCO Construction, Inc.	Mr. Reed Price	(435) 723-3770	(435) 723-3311
Ascent Construction	Mr. Dan Wall	(801) 299-1711	(801) 299-0663
Bellock Construction, Inc	Ms. Melody Bellock	(801) 277-7805	(801) 277-5751
Broderick and Henderson Const	Mr. Gary Broderick	(801) 225-9213	(801) 225-4697
Cal Wadsworth Construction`	Mr. Cal Wadsworth	(801) 208-1957	(801) 208-1975
Chad Husband Construction, Inc	Mr. Richard Marshall	(801) 972-1146	(801) 886-1784
Comtrol Inc.	Mr. Ralph B. Burk	(801) 561-2263	(801) 561-2305
Darrell Anderson Construction	Mr. James Anderson	(435) 752-6860	(435) 752-7606
Garff Construction	Mr. Phil Henriksen	(801) 973-4248	(801) 972-1928
Gramoll Construction	Mr. Ken Romney	(801) 295-2341	(801) 295-2356
Jepson Construction	Mr. Rick Jepson	(801) 774-8860	(801) 773-8980
Keller Construction	Mr. S. Daniel Hill	(801) 972-1018	(801) 972-1063
McCullough Engineering	Mr. Jim McCullough	(801) 466-4949	(801) 466-4989
Saunders Construction	Mr. Edward Saunders	(801) 782-7830	(801) 782-7856
Spectrum Construction of Utah	Mr. Ronald Snowden	(801) 915-6222	(801) 607-2203
Valley Design and Construction	Mr. Corey King	(801) 927-9542	(801) 927-9544
Wade Payne Construction, Inc.	Mr. Wade Payne	(801) 226-6144	(801) 226-7772

The bid documents will be available on Thursday, September 8, 2005 in electronic format from DFCM at 4110 State Office Building, Salt Lake City, Utah 84114, telephone (801) 538-3018 and on the DFCM web page at http://dfcm.utah.gov. For questions regarding this project, please contact Kurt Baxter, Project Manager, DFCM, at (801) 538-3174. No others are to be contacted regarding this project.

A **MANDATORY** pre-bid meeting and site visit will be held at 2:00 PM on Monday, September 19, 2005 at the Springville Fish Hatchery, 1115 North Main Street, Springville, Utah. All short listed prime contractors wishing to bid on this project must attend this meeting.

Bids must be submitted by 3:30 PM on Thursday, September 29, 2005 to DFCM, 4110 State Office Building, Salt Lake City, Utah 84114. Bids will be opened and read aloud in the DFCM Conference Room, 4110 State Office Building, Salt Lake City, Utah. Note: Bids must be received at 4110 State Office Building by the specified time. The contractor shall comply with and require all of its subcontractors to comply with the license laws as required by the State of Utah.

A bid bond in the amount of five percent (5%) of the bid amount, made payable to the Division of Facilities Construction and Management on DFCM's bid bond form, shall accompany the bid. The Division of Facilities Construction & Management reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of the State.

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
MARLA WORKMAN, CONTRACT COORDINATOR
4110 State Office Bldg., Salt Lake City, Utah 84114

STAGE II BIDDING PROCESS

ONLY CONTRACTORS PREVIOUSLY SHORT-LISTED DURING STAGE I ARE ALLOWED TO BID ON THIS PROJECT

1. Invitational Bid Procedures

Invitation to Bid: DFCM will notify each short-listed firm via e-mail and/or fax when a project is ready for construction services.

Bid Documents: Bidding documents including plans and specifications (if applicable) may be obtained by accessing DFCM's web page at http://dfcm.utah.gov or at DFCM's office 4110 State Office Building, Salt Lake City, Utah 84114.

Mandatory Pre-Bid Site Meeting: If required, the schedule contained in this document will indicate the date, time, and place of the mandatory pre-bid site meeting. At this meeting, contractors will receive additional instructions about the project and have an opportunity to ask questions about project details. If a firm fails to attend a pre-bid site meeting labeled "Mandatory" they will not be allowed to bid on the project.

Written Questions: The schedule contained in this document will indicate the deadline for submitting questions in writing to the DFCM Representative pertaining to this project.

Final Addendum: The schedule contained in this document will indicate the deadline for DFCM issuing the final addendum clarifying questions and changes to the scope of work. Contractors are responsible for obtaining and responding to information contained in the addenda.

Submitting Bids: Bids must be submitted to DFCM, 4110 State Office Building, Salt Lake City, Utah 84114 by the deadline indicated on the schedule contained in this document. Bids submitted after the deadline will not be accepted. Bids will be opened at DFCM on the date, time, and place indicated on the schedule. (Additional information pertaining to bidding is contained later in this document). It is your responsibility to allow for the time needed to park on Capitol Hill as recent construction activity has made the parking more difficult. Identification is required to enter the building.

Subcontractors List: The firm selected for the project must submit a list of all subcontractors by the deadline indicated on the schedule contained in this document. (Additional information pertaining to subcontractor lists is contained later in this document)

2. Drawings and Specifications, Other Contract Documents

Drawings and Specifications, as well as other available Contract Documents, may be obtained as stated in the Notice to Contractors.

3. **Bids**

Before submitting a bid, each bidder shall carefully examine the Contract Documents; shall visit the site of the Work; shall fully inform themselves as to all existing conditions and limitations; and shall include in the bid the cost of all items required by the Contract Documents. If the bidder observes that portions of the Contract Documents are at variance with applicable laws, building codes, rules, regulations or contain obvious erroneous or uncoordinated information, the bidder shall promptly notify the DFCM Representative and the necessary changes shall be accomplished by Addendum.

The bid, bearing original signatures, must be typed or handwritten in ink on the Bid Form provided in the procurement documents and submitted in a sealed envelope at the location specified by the Notice to Contractor's prior to the published deadline for the submission of bids.

Bid bond security, in the amount of five percent (5%) of the bid, made payable to the Division of Facilities Construction and Management, shall accompany bid. THE BID BOND MUST BE ON THE BID BOND FORM PROVIDED IN THE PROCUREMENT DOCUMENTS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID.

If the bid bond security is submitted on a bid bond form other than the DFCM's required bid bond form, and the bid security meets all other legal requirements, the bidder will be allowed to provide an acceptable bid bond by the close of business on the next business day following notification by DFCM of submission of a defective bid bond security. **Note: A cashier's check cannot be used as a substitute for a bid bond.**

4. **Contract and Bond**

The Contractor's Agreement will be in the form bound in the specifications. The Contract Time will be as indicated in the bid. The successful bidder, simultaneously with the execution of the Contract Agreement, will be required to furnish a performance bond and a payment bond, both bearing original signatures, upon the forms provided in the procurement documents. The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the Contract Sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for Subcontractors will be specified in the Supplementary General Conditions.

5. Listing of Subcontractors

Listing of Subcontractors shall be as summarized in the "Instructions and Subcontractor's List Form", which are included as part of these Contract Documents. The subcontractors list shall be delivered to DFCM or faxed to DFCM at (801)538-3677 within 24 hours of the bid opening. Requirements for listing additional subcontractors will be listed in the Contract Documents.

DFCM retains the right to audit or take other steps necessary to confirm compliance with requirements for the listing and changing of subcontractors. Any contractor who is found to not be in compliance with these requirements is subject to a debarment hearing and may be debarred from consideration for award of contract for a period of up to three years.

6. Interpretation of Drawings and Specifications

If any person or entity contemplating submitting a bid is in doubt as to the meaning of any part of the drawings, specifications or other Contract Documents, such person shall submit to the DFCM Representative a request for an interpretation thereof. The person or entity submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by Addenda duly issued and a copy of such Addenda will be mailed or delivered to each person or entity receiving a set of documents. Neither DFCM nor A/E will be responsible for any other explanations or interpretations of the proposed documents. A/E shall be deemed to refer to the architect or engineer hired by DFCM as the A/E or Consultant for the Project.

7. Addenda

Any Addenda issued during the time of bidding shall become part of the Contract Documents made available to the bidders for the preparation of the bid, shall be covered in the bid, and shall be made a part of the Contract.

8. Award of Contract

The Contract will be awarded as soon as possible to the lowest, responsive and responsible bidder, based on the lowest combination of base bid and acceptable prioritized alternates, provided the bid is reasonable, is in the interests of the State of Utah to accept and after applying the Utah Preference Laws in U.C.A. Title 63, Chapter 56. The DFCM reserves the right to waive any technicalities or formalities in any bid or in the bidding. Alternates will be accepted on a prioritized basis with Alternate 1 being highest priority, Alternate 2 having second priority, etc.

9. **DFCM Contractor Performance Rating**

DFCM will evaluate the performance of the Contractor. This evaluation may include comments from the User. The Contractor will have an opportunity to review and comment on the evaluation. Evaluations, including the Contractor's comments, may be considered in future selection in the evaluation of the Contractor's past performance.

10. **Licensure**

The Contractor shall comply with and require all of its Subcontractors to comply with the license laws as required by the State of Utah.

11. **Right to Reject Bids**

DFCM reserves the right to reject any or all Bids.

12. **Time is of the Essence**

The completion deadline for this project is **February 20, 2006**. Failure to meet the completion deadline may result in a poor performance rating from DFCM which may have a negative impact on your firm's ability to obtain future work with the state of Utah and may also result in liquidated damages being assessed. Time is of the essence in regard to all the requirements of the Contract Documents.

13. **Withdrawal of Bids**

Bids may be withdrawn on written request received from bidders within 24 hours after the bid opening if the contractor has made an error in preparing the bid.

14. **Product Approvals**

Where reference is made to one or more proprietary products in the Contract Documents, but restrictive descriptive materials of one or more manufacturer(s) is referred to in the Contract Documents, the products of other manufacturers will be accepted, provided they equal or exceed

the standards set forth in the drawings and specifications and are compatible with the intent and purpose of the design, subject to the written approval of the A/E. Such written approval must occur prior to the deadline established for the last scheduled addenda to be issued. The A/E's written approval will be in an issued Addendum. If the descriptive material is not restrictive, the products of other manufacturers specified will be accepted without prior approval provided they are compatible with the intent and purpose of the design as determined by the A/E.

15. **Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors**

Contractors shall respond promptly to any inquiry in writing by the DFCM to any concern of financial responsibility of the Contractor, Subcontractor or Sub-subcontractor.

16. **Debarment**.

By submitting a bid, the Contractor certifies that neither it nor its principals, including project and site managers, have been, or are under consideration for, debarment or suspension, or any action that would exclude such from participation in a construction contract by any governmental department or agency. If the Contractor cannot certify this statement, attach to the bid a detailed written explanation which must be reviewed and approved by the DFCM as part of the requirements for award of the Project.

PROJECT SCHEDULE - REVISED

Stage II = Two-Stage Bidding Process

PROJECT NAME:	**TANK REPLACEMENT - SPRINGVILLE FISH HATCHERY DIVISION OF WILDLIFE RESOURCES – SPRINGVILLE, UTAH**
DFCM PROJECT NO.:	**05123520**

Event	Day	Date	Time	Place
Stage II Bidding Documents Available	Thursday	September 8, 2005		DFCM, 4110 State Office Building, SLC, UT and DFCM web site *
Mandatory Pre-bid Site Meeting	Monday	September 19, 2005	2:00 PM	Springville Fish Hatchery 1115 North Main Street Springville, UT
Last Day to Submit Questions	Thursday	September 22, 2005	4:00 PM	DFCM, 4110 State Office Building, SLC, UT
Final Addendum Issued	Monday	September 26, 2005	4:00 PM	DFCM, 4110 State Office Building, SLC, UT or DFCM web site*
Prime Contractors Turn in Bid and Bid Bond / Bid Opening in DFCM Conference Room	Thursday	September 29, 2005	3:30 PM	DFCM, 4110 State Office Building, SLC, UT
Subcontractors List Due	Friday	September 30, 2005	3:30 PM	DFCM, 4110 State Office Building, SLC, UT
Project Completion Date	Monday	February 20, 2006	5:00 PM	

*** DFCM's web site address is http://dfcm.utah.gov**

BID FORM - REVISED

NAME OF BIDDER _____ DATE _____

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Notice to Contractors" and in accordance with the Request for Bids for the **TANK REPLACEMENT – SPRINGVILLE FISH HATCHERY – DIVISION OF WILDLIFE RESOURCES – SPRINGVILLE, UTAH DFCM PROJECT NO. 05123520** and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

BASE BID: The base bid is the entire project as described and depicted in the construction documents with the exception of replacement of the existing main floor windows.

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATE #1: Removal of the existing main floor windows and replacement with new vinyl windows according to the construction documents.

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by **February 20, 2006** after receipt of the Notice to Proceed, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **$250.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____.

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract. The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable l00% Performance and Payment bonds are not delivered within time set forth.

Type of Organization:

_____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

_____

Respectfully submitted,

_____
Name of Bidder

ADDRESS:

_____

_____

_____
Authorized Signature

BID BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed, (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the STATE OF UTAH, hereinafter referred to as the "Obligee," in the amount of $_____ (5% of the accompanying bid), being the sum of this Bond to which payment the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted to Obligee the accompanying bid incorporated by reference herein, dated as shown, to enter into a contract in writing for the _____ _____ Project.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the said principal does not execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the principal, then the sum of the amount stated above will be forfeited to the State of Utah as liquidated damages and not as a penalty; if the said principal shall execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the Principal, then this obligation shall be null and void. It is expressly understood and agreed that the liability of the Surety for any and all defaults of the Principal hereunder shall be the full penal sum of this Bond. The Surety, for value received, hereby stipulates and agrees that obligations of the Surety under this Bond shall be for a term of sixty (60) days from actual date of the bid opening.

PROVIDED, HOWEVER, that this Bond is executed pursuant to provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals on the date indicated below, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

DATED this _____ day of _____, 20_____ .

Principal's name and address (if other than a corporation):

_____

_____

By: _____

Title: _____

Principal's name and address (if a corporation):

_____

_____

By: _____

Title: _____

(Affix Corporate Seal)

Surety's name and address:

_____

_____

By: _____

Attorney-in-Fact (Affix Corporate Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.
My Commission Expires: _____
Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone:

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

INSTRUCTION AND SUBCONTRACTORS LIST FORM

The three low bidders, as well as all other bidders that desire to be considered, are required by law to submit to DFCM within 24 hours of bid opening a list of **ALL** first-tier subcontractors, including the subcontractor's name, bid amount and other information required by Building Board Rule and as stated in these Contract Documents, on the following basis:

PROJECTS UNDER $500,000 - ALL SUBS $20,000 OR OVER MUST BE LISTED
PROJECTS $500,000 OR MORE - ALL SUBS $35,000 OR OVER MUST BE LISTED

- Any additional subcontractors identified in the bid documents shall also be listed.
- The DFCM Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law.
- List subcontractors for base bid as well as the impact on the list that the selection of any alternate may have.
- Bidder may not list more than one subcontractor to perform the same work.
- Bidder must list "Self" if performing work itself.

LICENSURE:

The subcontractor's name, the type of work, the subcontractor's bid amount, and the subcontractor's license number as issued by DOPL, if such license is required under Utah Law, shall be listed. Bidder shall certify that all subcontractors, required to be licensed, are licensed as required by State law. A subcontractor includes a trade contractor or specialty contractor and does not include suppliers who provide only materials, equipment, or supplies to a contractor or subcontractor.

BIDDER LISTING 'SELF' AS PERFORMING THE WORK:

Any bidder that is properly licensed for the particular work and intends to perform that work itself in lieu of a subcontractor that would otherwise be required to be on the subcontractor list, must insert the term 'Self' for that category on the subcontractor list form. Any listing of 'Self' on the sublist form shall also include the amount allocated for that work.

'SPECIAL EXCEPTION':

A bidder may list 'Special Exception' in place of a subcontractor when the bidder intends to obtain a subcontractor to perform the work at a later date because the bidder was unable to obtain a qualified or reasonable bid under the provisions of U.C.A.Section 63A-5-208(4). The bidder shall insert the term 'Special Exception' for that category of work, and shall provide documentation with the subcontractor list describing the bidder's efforts to obtain a bid of a qualified subcontractor at a reasonable cost and why the bidder was unable to obtain a qualified subcontractor bid. The Director must find that the bidder complied in good faith with State law requirements for any 'Special Exception' designation, in order for the bid to be considered. If awarded the contract, the Director shall supervise the bidder's efforts to obtain a qualified subcontractor bid. The amount of the awarded contract may not be adjusted to reflect the actual amount of the subcontractor's bid. Any listing of 'Special Exception' on the sublist form shall also include amount allocated for that work.

GROUNDS FOR DISQUALIFICATION:

The Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law. Director may withhold awarding the contract to a particular bidder if one or more of the proposed subcontractors are considered by the Director to be unqualified to do the Work or for such other reason in the best interest of the State of Utah. Notwithstanding any other provision in these instructions, if there is a good faith error on the sublist form, at the sole discretion of the Director, the Director may provide notice to the contractor and the contractor shall have 24 hours to submit the correction to the Director. If such correction is submitted timely, then the sublist requirements shall be considered met.

CHANGES OF SUBCONTRACTORS SPECIFICALLY IDENTIFIED ON SUBLIST FORM:

Subsequent to twenty-four hours after the bid opening, the contractor may change its listed subcontractors only after receiving written permission from the Director based on complying with all of the following criteria.

(1) The contractor has established in writing that the change is in the best interest of the State and that the contractor establishes an appropriate reason for the change, which may include, but not is not limited to, the following reasons: the original subcontractor has failed to perform, or is not qualified or capable of performing, and/or the subcontractor has requested in writing to be released.
(2) The circumstances related to the request for the change do not indicate any bad faith in the original listing of the subcontractors.
(3) Any requirement set forth by the Director to ensure that the process used to select a new subcontractor does not give rise to bid shopping.
(4) Any increase in the cost of the subject subcontractor work is borne by the contractor.
(5) Any decrease in the cost of the subject subcontractor work shall result in a deductive change order being issued for the contract for such decreased amount.
(6) The Director will give substantial weight to whether the subcontractor has consented in writing to being removed unless the Contractor establishes that the subcontractor is not qualified for the work.

EXAMPLE:

Example of a list where there are only four subcontractors:

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #
ELECTRICAL	ABCD Electric Inc.	$350,000.00	123456789000
LANDSCAPING	"Self"	300,000.00	123456789000
CONCRETE (ALTERNATE #1)	XYZ Concrete Inc	298,000.00	987654321000
MECHANICAL	"Special Exception" (attach documentation)	Fixed at: 350,000.00	(TO BE PROVIDED AFTER OBTAINING SUBCONTRACTOR)

PURSUANT TO STATE LAW - SUBCONTRACTOR BID AMOUNTS CONTAINED IN THIS SUBCNTRACTOR LIST SHALL NOT BE DISCLOSED UNTIL THE CONTRACT HAS BEEN AWARDED.

SUBCONTRACTORS LIST

PROJECT TITLE: _____

Caution: You must read and comply fully with instructions.

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #

We certify that:

1. This list includes all subcontractors as required by the instructions, including those related to the base bid as well as any alternates.
2. We have listed "Self" or "Special Exception" in accordance with the instructions.
3. All subcontractors are appropriately licensed as required by State law.

FIRM: _____

DATE: _____ SIGNED BY: _____

NOTICE: FAILURE TO SUBMIT THIS FORM, PROPERLY COMPLETED AND SIGNED, AS REQUIRED IN THESE CONTRACT DOCUMENTS, SHALL BE GROUNDS FOR DFCMS REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY DFCM. ATTACH A SECOND PAGE IF NECESSARY.

FUGITIVE DUST PLAN

The Contractor will fill out the form and file the original with the Division of Air Quality and a copy of the form with the Division of Facilities Construction & Management, prior to the issuance of any notice to proceed.

The Contractor will be fully responsible for compliance with the Fugitive Dust Control Plan, including the adequacy of the plan, any damages, fines, liability, and penalty or other action that results from noncompliance.

Utah Division of Air Quality
April 20, 1999

GUIDANCE THAT MUST BE CONSIDERED IN DEVELOPING AND SUBMITTING A DUST CONTROL PLAN FOR COMPLIANCE WITH R307-309-3, 4, 5, 6, 7

Source Information:

1. Name of your operation (source): provide a name if the source is a construction site.

2. Address or location of your operation or construction site.

3. UTM coordinates or Longitude/Latitude of stationary emission points at your operation.

4. Lengths of the project, if temporary (time period).

5. Description of process (include all sources of dust and fugitive dust). Please, if necessary, use additional sheets of paper for this description. Be sure to mark it as an attachment.

6. Type of material processed or disturbed.

7. Amount of material processed (tons per year, tons per month, lbs./hr., and applicable units).

8. Destination of product (where will the material produced be used or transported, be specific, provide address or specific location), information needed for temporary relocation applicants.

9. Identify the individual who is responsible for the implementation and maintenance of fugitive dust control measures. List name(s), position(s) and telephone number(s).

10. List, and attach copies of any contract lease, liability agreement with other companies that may, or will, be responsible for dust control on site or on the project.

Description of Fugitive Dust Emission Activities
(Things to consider in addressing fugitive dust control strategies.)

1. Type of activities (drilling and blasting, road construction, development construction, earth moving and excavation, handling and hauling materials, cleaning and leveling, etc).

2. List type of equipment generating the fugitive dust.

3. Diagram the location of each activity or piece of equipment on site. Please attach the diagram.

4. Provide pictures or drawings of each activity. Include a drawing of the unpaved/paved road network used to move loads "on" and "off" property.

5. Vehicle miles travels on unpaved roads associated with the activity (average speed).

6. Type of dust emitted at each source (coal, cement, sand, soil, clay, dust, etc.)

7. Estimate the size of the release area at which the activity occurs (square miles). For haul or dirt roads include total miles of road in use during the activity.

Description of Fugitive Dust Emission Controls on Site

Control strategies must be designed to meet 20% opacity or less on site (a lesser opacity may be defined by Approval Order conditions or federal requirements such as NSPS), and control strategies must prevent exceeding 10% opacity from fugitive dust at the property boundary (site boundary) for compliance with R307-309-3.

1. Types of ongoing emission controls proposed for each activity, each piece of equipment, and haul roads.

2. Types of additional dust controls proposed for bare, exposed surfaces (chemical stabilization, synthetic cover, wind breaks, vegetative cover, etc).

3. Method of application of dust suppressant.

4. Frequency of application of dust suppressant.

5. Explain what triggers the use of a special control measure other than routine measures already in place, such as covered loads or measures covered by a permit condition (increase in opacity, high winds, citizen complaints, dry conditions, etc).

6. Explain in detail what control strategies/measures will be implemented off-hours, i.e., Saturdays/Sundays/Holidays, as well as 6 PM to 6 AM each day.

Description of Fugitive Dust Control Off-site

Prevent, to the maximum extent possible, deposition of materials, which may create fugitive dust on public and private paved roads in compliance with R307-309-5, 6, 7.

1. Types of emission controls initiated by your operation that are in place "off" property (application of water, covered loads, sweeping roads, vehicle cleaning, etc.).

2. Proposed remedial controls that will be initiated promptly if materials, which may create fugitive dust, are deposited on public and private paved roads.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Fugitive Dust Control Plan Violation Report

When a source is found in violation of R307-309-3 or in violation of the Fugitive Dust Control Plan, the course must submit a report to the Executive Secretary within 15 days after receiving a Notice of Violation. The report must include the following information:

1. Name and address of dust source.

2. Time and duration of dust episode.

3. Meteorological conditions during the dust episode.

4. Total number and type of fugitive dust activities and dust producing equipment within each operation boundary. If no change has occurred from the existing dust control plan, the source should state that the activity/equipment is the same.

5. Fugitive dust activities or dust producing equipment that caused a violation of R-307-309-3 or the sources dust control plan.

6. Reasons for failing to control dust from the dust generating activity or equipment.

7. New and/or additional fugitive dust control strategies necessary to achieve compliance with R307-309-3, 4, 5, 6, or 7.

8. If it can not be demonstrated that the current approved Dust Control Plan can result in compliance with R307-309-3 through 7, the Dust Control Plan must be revised so as to demonstrate compliance with 307-309-3 through 7. Within 30 days of receiving a fugitive dust Notice of Violation, the source must submit the revised Plan to the Executive Secretary for review and approval.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Attachments: DFCM Form FDR R-307-309, Rule 307-309

CONTRACTOR'S AGREEMENT

FOR:

_____
_____
_____

THIS CONTRACTOR'S AGREEMENT, made and entered into this ____ day of _____, 20__, by and between the DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT, hereinafter referred to as "DFCM", and _____, incorporated in the State of _____ and authorized to do business in the State of Utah, hereinafter referred to as "Contractor", whose address is _____.

WITNESSETH: WHEREAS, DFCM intends to have Work performed at _____ _____.

WHEREAS, Contractor agrees to perform the Work for the sum stated herein.

NOW, THEREFORE, DFCM and Contractor for the consideration provided in this Contractor's Agreement, agree as follows:

ARTICLE 1. SCOPE OF WORK. The Work to be performed shall be in accordance with the Contract Documents prepared by _____ and entitled "_____."

The DFCM General Conditions ("General Conditions") dated May 25, 2005 on file at the office of DFCM and available on the DFCM website, are hereby incorporated by reference as part of this Agreement and are included in the specifications for this Project. All terms used in this Contractor's Agreement shall be as defined in the Contract Documents, and in particular, the General Conditions.

The Contractor Agrees to furnish labor, materials and equipment to complete the Work as required in the Contract Documents which are hereby incorporated by reference. It is understood and agreed by the parties hereto that all Work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of DFCM or its authorized representative. The relationship of the Contractor to the DFCM hereunder is that of an independent Contractor.

ARTICLE 2. CONTRACT SUM. The DFCM agrees to pay and the Contractor agrees to accept in full performance of this Contractor's Agreement, the sum of _____ _____ DOLLARS AND NO CENTS ($_____.00), which is the base bid, and which sum also includes the cost of a 100%

Performance Bond and a 100% Payment Bond as well as all insurance requirements of the Contractor. Said bonds have already been posted by the Contractor pursuant to State law. The required proof of insurance certificates have been delivered to DFCM in accordance with the General Conditions before the execution of this Contractor's Agreement.

ARTICLE 3. TIME OF COMPLETION AND DELAY REMEDY. The Work shall be Substantially Complete within _____ (___) calendar days after the date of the Notice to Proceed. Contractor agrees to pay liquidated damages in the amount of $_____ per day for each day after expiration of the Contract Time until the Contractor achieves Substantial Completion in accordance with the Contract Documents, if Contractor's delay makes the damages applicable. The provision for liquidated damages is: (a) to compensate the DFCM for delay only; (b) is provided for herein because actual damages can not be readily ascertained at the time of execution of this Contractor's Agreement; (c) is not a penalty; and (d) shall not prevent the DFCM from maintaining Claims for other non-delay damages, such as costs to complete or remedy defective Work.

No action shall be maintained by the Contractor, including its or Subcontractor or suppliers at any tier, against the DFCM or State of Utah for damages or other claims due to losses attributable to hindrances or delays from any cause whatsoever, including acts and omissions of the DFCM or its officers, employees or agents, except as expressly provided in the General Conditions. The Contractor may receive a written extension of time, signed by the DFCM, in which to complete the Work under this Contractor's Agreement in accordance with the General Conditions.

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of this Contractor's Agreement, the Conditions of the Contract (DFCM General Conditions, Supplementary and other Conditions), the Drawings, Specifications, Addenda and Modifications. The Contract Documents shall also include the bidding documents, including the Notice to Contractors, Instructions to Bidders/Proposers and the Bid/Proposal, to the extent not in conflict therewith and other documents and oral presentations that are documented as an attachment to the contract.

All such documents are hereby incorporated by reference herein. Any reference in this Contractor's Agreement to certain provisions of the Contract Documents shall in no way be construed as to lessen the importance or applicability of any other provisions of the Contract Documents.

ARTICLE 5. PAYMENT. The DFCM agrees to pay the Contractor from time to time as the Work progresses, but not more than once each month after the date of Notice to Proceed, and only upon Certificate of the A/E for Work performed during the preceding calendar month, ninety-five percent (95%) of the value of the labor performed and ninety-five percent (95%) of the value of materials furnished in place or on the site. The Contractor agrees to furnish to the DFCM invoices for materials purchased and on the site but not installed, for which the

Contractor requests payment and agrees to safeguard and protect such equipment or materials and is responsible for safekeeping thereof and if such be stolen, lost or destroyed, to replace same.

Such evidence of labor performed and materials furnished as the DFCM may reasonably require shall be supplied by the Contractor at the time of request for Certificate of Payment on account. Materials for which payment has been made cannot be removed from the job site without DFCM's written approval. Five percent (5%) of the earned amount shall be retained from each monthly payment. The retainage, including any additional retainage imposed and the release of any retainage, shall be in accordance with UCA 13-8-5 as amended. Contractor shall also comply with the requirements of UCA 13-8-5, including restrictions of retainage regarding subcontractors and the distribution of interest earned on the retention proceeds. The DFCM shall not be responsible for enforcing the Contractor's obligations under State law in fulfilling the retention law requirements with subcontractors at any tier.

ARTICLE 6. INDEBTEDNESS. Before final payment is made, the Contractor must submit evidence satisfactory to the DFCM that all payrolls, materials bills, subcontracts at any tier and outstanding indebtedness in connection with the Work have been properly paid. Final Payment will be made after receipt of said evidence, final acceptance of the Work by the DFCM as well as compliance with the applicable provisions of the General Conditions.

Contractor shall respond immediately to any inquiry in writing by DFCM as to any concern of financial responsibility and DFCM reserves the right to request any waivers, releases or bonds from Contractor in regard to any rights of Subcontractors (including suppliers) at any tier or any third parties prior to any payment by DFCM to Contractor.

ARTICLE 7. ADDITIONAL WORK. It is understood and agreed by the parties hereto that no money will be paid to the Contractor for additional labor or materials furnished unless a new contract in writing or a Modification hereof in accordance with the General Conditions and the Contract Documents for such additional labor or materials has been executed. The DFCM specifically reserves the right to modify or amend this Contractor's Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work.

ARTICLE 8. INSPECTIONS. The Work shall be inspected for acceptance in accordance with the General Conditions.

ARTICLE 9. DISPUTES. Any dispute, PRE or Claim between the parties shall be subject to the provisions of Article 7 of the General Conditions. DFCM reserves all rights to pursue its rights and remedies as provided in the General Conditions.

ARTICLE 10. TERMINATION, SUSPENSION OR ABANDONMENT. This Contractor's Agreement may be terminated, suspended or abandoned in accordance with the General Conditions.

ARTICLE 11. DFCM'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE USE THEREOF. The DFCM may withhold from payment to the Contractor such amount as, in DFCM's judgment, may be necessary to pay just claims against the Contractor or Subcontractor at any tier for labor and services rendered and materials furnished in and about the Work. The DFCM may apply such withheld amounts for the payment of such claims in DFCM's discretion. In so doing, the DFCM shall be deemed the agent of Contractor and payment so made by the DFCM shall be considered as payment made under this Contractor's Agreement by the DFCM to the Contractor. DFCM shall not be liable to the Contractor for any such payment made in good faith. Such withholdings and payments may be made without prior approval of the Contractor and may be also be prior to any determination as a result of any dispute, PRE, Claim or litigation.

ARTICLE 12. INDEMNIFICATION. The Contractor shall comply with the indemnification provisions of the General Conditions.

ARTICLE 13. SUCCESSORS AND ASSIGNMENT OF CONTRACT. The DFCM and Contractor, respectively bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement, and to partners, successors, assigns and legal representatives of such other party with respect to all covenants, provisions, rights and responsibilities of this Contractor's Agreement. The Contractor shall not assign this Contractor's Agreement without the prior written consent of the DFCM, nor shall the Contractor assign any moneys due or to become due as well as any rights under this Contractor's Agreement, without prior written consent of the DFCM.

ARTICLE 14. RELATIONSHIP OF THE PARTIES. The Contractor accepts the relationship of trust and confidence established by this Contractor's Agreement and covenants with the DFCM to cooperate with the DFCM and A/E and use the Contractor's best skill, efforts and judgment in furthering the interest of the DFCM; to furnish efficient business administration and supervision; to make best efforts to furnish at all times an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economic manner consistent with the interests of the DFCM.

ARTICLE 15. AUTHORITY TO EXECUTE AND PERFORM AGREEMENT. Contractor and DFCM each represent that the execution of this Contractor's Agreement and the performance thereunder is within their respective duly authorized powers.

ARTICLE 16. ATTORNEY FEES AND COSTS. Except as otherwise provided in the dispute resolution provisions of the General Conditions, the prevailing party shall be entitled to reasonable attorney fees and costs incurred in any action in the District Court and/or appellate body to enforce this Contractor's Agreement or recover damages or any other action as a result of a breach thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contractor's Agreement on the day and year stated hereinabove.

CONTRACTOR: _____

_____
Signature Date

Title: _____

State of _____)
)
County of _____) _____
Please type/print name clearly

On this ____ day of _____, 20____, personally appeared before me, _____, whose identity is personally known to me (or proved to me on the basis of satisfactory evidence) and who by me duly sworn (or affirmed), did say that he (she) is the _____ (title or office) of the firm and that said document was signed by him (her) in behalf of said firm.

_____
Notary Public

(SEAL)

My Commission Expires _____

APPROVED AS TO AVAILABILITY OF FUNDS:

_____
Financial Manager, Date
Division of Facilities Construction and Management

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

_____
_____ Date
Manager -
Capital _____

APPROVED AS TO FORM:
ATTORNEY GENERAL
May 25, 2005
By: Alan S. Bachman
Asst Attorney General

APPROVED FOR EXPENDITURE:

_____
Division of Finance Date

PERFORMANCE BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

That _____ hereinafter referred to as the "Principal" and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah, hereinafter referred to as the "Obligee, " in the amount of _____ _____ DOLLARS ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____, for the approximate sum of _____ _____ Dollars ($_____), which Contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully perform the Contract in accordance with the Contract Documents including, but not limited to, the Plans, Specifications and conditions thereof, the one year performance warranty, and the terms of the Contract as said Contract may be subject to Modifications or changes, then this obligation shall be void; otherwise it shall remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the state named herein or the heirs, executors, administrators or successors of the Owner.

The parties agree that the dispute provisions provided in the Contract Documents apply and shall constitute the sole dispute procedures of the parties.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the Provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20_____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____ (Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____ (Seal)

Attorney-in-Fact

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney in-fact of the above-named Surety Company and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____
Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____ _____, a corporation organized and existing under the laws of the State of _____authorized to do business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); with its principal office in the City of _____, hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah hereinafter referred to as the "Obligee," in the amount of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____ for the approximate sum of _____ _____ Dollars ($_____), which contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall pay all claimants supplying labor or materials to Principal or Principal's Subcontractors in compliance with the provisions of Title 63, Chapter 56, of Utah Code Annotated, l953, as amended, and in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise it shall remain in full force and effect.

That said Surety to this Bond, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any way affect its obligation on this Bond, and does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications or drawings and agrees that they shall become part of the Contract Documents.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____ _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

CHANGE ORDER #_____

CONTRACTOR:

ARCHITECT:

AGENCY OR INSTITUTION:
PROJECT NAME:
PROJECT NUMBER:
CONTRACT NUMBER:
DATE:

CONSTRUCTION CHANGE DIRECTIVE NO.	PROPOSAL REQUEST NO.	AMOUNT		DAYS	
		INCREASE	DECREASE	INCREASE	DECREASE

	Amount	Days	Date
ORIGINAL CONTRACT			
TOTAL PREVIOUS CHANGE ORDERS			
TOTAL THIS CHANGE ORDER			
ADJUSTED CONTRACT			

DFCM and Contractor agree that the terms, contract sum, scope of the Work and time specified in this Change Order shall constitute the full accord and satisfaction, and complete adjustment to the Contract and includes all direct and indirect costs and effects related to, incidental to, and/or reasonably implied from such change in the contract terms, sum, scope of the Work and time.

Contractor:_____
Date

Architect/Engineer:_____
Date

Agency or Institution:_____
Date

DFCM: _____
Date

Funding Verification:_____
Date

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT _____ PROJECT NO: _____

AGENCY/INSTITUTION _____

AREA ACCEPTED _____

The Work performed under the subject Contract has been reviewed on this date and found to be Substantially Completed as defined in the General Conditions; including that the construction is sufficiently completed in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the State of Utah can occupy the Project or specified area of the Project for the use for which it is intended.

The DFCM accepts the Project or specified area of the Project as Substantially Complete and will assume full possession of the Project or specified area of the Project at _____ (time) on _____ (date).

The DFCM accepts the Project for occupancy and agrees to assume full responsibility for maintenance and operation, including utilities and insurance, of the Project subject to the itemized responsibilities and/or exceptions noted below:

_____

_____

_____

A list of items to be completed or corrected is attached hereto. The failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents, including authorized changes thereof.

The Contractor shall complete or correct the Work on the list of items appended hereto within _____ calendar days from the above date of issuance of this Certificate. The amount withheld pending completion of the list of items noted and agreed to shall be: $_____.

_____ by: _____

CONTRACTOR (include name of firm) DATE

_____ by: _____

A/E DATE

_____ by: _____

USING INSTITUTION OR AGENCY DATE

_____ by: _____

DFCM DATE

cc: Parties Noted
DFCM, Director

TECHNICAL SPECIFICATIONS

FOR

DEPARTMENT OF NATURAL RESOURCES

SPRINGVILLE HATCHERY FRY TANKS
WATERLINE REPLACEMENT
DFCM # 05123520

DOCUMENT 00010

TABLE OF CONTENTS

END OF SECTION

SECTION 01100

SUMMARY OF WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General Description of Work.

B. Excavation

C. Location

D. Work Sequence

1.2 GENERAL DESCRIPTION OF WORK

A. The Springville Hatchery Upgrades Project consists of the following WORK:

Removal of the existing concrete rearing tanks, installation of new underground an above grade piping, trench drains, concrete floor, miscellaneous wood carpentry, removal and reinstallation of windows and doors and installation of state furnished rearing tanks.

1.3 LOCATION

A. The WORK is located at the Springville Fish Hatchery, at 1155 North Main in Springville, Utah.

1.4 SEQUENCE OF WORK

A. The hatchery building will be completely closed for the construction of this project. Access to the site will require coordination with the staff as to not disturb other existing operations.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01200

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Schedule of values.

B. Applications for payment.

C. Change procedures.

D. Defect assessment.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals

B. Section 01300 – Materials and Equipment

1.3 SCHEDULE OF VALUES

A. Submit printed schedule on AIA Form G703 - Continuation Sheet for G702.

B. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

C. Format: Utilize Table of Contents of this Project Manual. Identify each line item with number and title of major specification Section.

D. Include in each line item, amount of Allowances specified in this section.

E. Include within each line item, direct proportional amount of Contractor's overhead and profit.

F. Revise schedule to list approved Change Orders, with each Application For Payment.

1.4 APPLICATIONS FOR PAYMENT

A. Submit three copies of each application on AIA Form G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet for G702.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Submit updated construction schedule with each Application for Payment.

D. Payment Period: Submit at intervals stipulated in the Agreement.

E. Submit with transmittal letter as specified for Submittals in Section 01300.

F. Substantiating Data: When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
   1. Construction progress schedules, revised and current as specified in Section 01300.

1.5 CHANGE PROCEDURES

A. Submittals: Submit name of individual authorized to receive change documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. The Architect/Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on DFCM Construction Change Directive Form.

C. The Architect/Engineer may issue a Proposal Request including a detailed description of proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change. Contractor will prepare and submit estimate within 10 days.

D. Contractor may propose changes by submitting a request for change to Architect/Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change, and effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on Work by separate or other Contractors. Document requested substitutions in accordance with Section 01600.

E. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation.

F. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under Construction Change Directive. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

G. Construction Change Directive: Architect/Engineer may issue directive, on DFCM Form signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.

H. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the

Contract. Architect/Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.

I. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

J. Document each quotation for change in cost or time with sufficient data to allow evaluation of quotation.

K. Change Order Forms: DFCM Change Order Form

L. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

M. Correlation Of Contractor Submittals:
1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
2. Promptly revise progress schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
3. Promptly enter changes in Project Record Documents.

1.6 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Architect/Engineer, it is not practical to remove and replace the Work, the Architect/Engineer will direct appropriate remedy or adjust payment.

C. The defective Work may remain, but unit sum/price will be adjusted to new sum/price at discretion of Architect/Engineer.

D. Defective Work will be partially repaired to instructions of Architect/Engineer, and unit sum/price will be adjusted to new sum/price at discretion of Architect/Engineer. Owner.

E. Individual specification sections may modify these options or may identify specific formula or percentage sum/price reduction.

F. Authority of Architect/Engineer to assess defects and identify payment adjustments, is final.

G. Non-Payment For Rejected Products: Payment will not be made for rejected products for any of the following:
1. Products wasted or disposed of in a manner that is not acceptable.

2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from transporting vehicle.
4. Products placed beyond lines and levels of required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures.

B. Construction progress schedules.

C. Proposed products list.

D. Shop drawings.

E. Product data.

F. Manufacturers' instructions.

G. Manufacturers' certificates.

H. Construction photographs.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control.

B. Section 01700 - Contract Closeout.

1.3 SUBMITTAL PROCEDURES

A. Transmit each submittal with Engineer accepted form.

B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail name or number(s), and specification Section number, as appropriate.

D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.

E. Schedule submittals to expedite the Project, and deliver to Engineer at 40 West Cache Valley Blvd Building 3B Logan, Utah 84341. Coordinate submission of related items.

F. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

G. Provide space for Contractor and Engineer review stamps.

H. Revise and resubmit submittals as required, identify all changes made since previous submittal.

I. Distribute copies of reviewed submittals to affected parties. Instruct parties to promptly report any inability to comply with provisions.

1.4 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial progress schedule in duplicate within 10 days after date established in Notice to Proceed for Engineer review. Submit progress schedule no later than pre-construction conference.

B. Revise and resubmit as required.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

D. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

E. Indicate estimated percentage of completion for each item of Work at each submission.

F. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates.

1.5 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.6 SHOP DRAWINGS

A. Submit the number of opaque reproductions which Contractor requires, plus five (5) copies which will be retained by Engineer.

B. Except as may otherwise be indicated herein, the ENGINEER will return prints of each submittal to the CONTRACTOR with its comments noted thereon, within 15 calendar days following their receipt by the ENGINEER. It is considered reason able that the contractor shall make a complete an acceptable submittal to the engineer by the second submission of a submittal item. The STATE OF UTAH reserves the right to withhold monies due to the contractor to cover additional costs of the engineers for review beyond the second submittal. The engineers maximum review period for each submittal, including all resubmittals, will be 15 days per submittal. In other words, the maximum review period for that submittal could be 45 days.

C. After review, distribute in accordance with Article on Procedures above and for Record Documents described in the General Conditions.

D. Fabrication of an item shall be commenced only after the engineer has reviewed the pertinent submittals and returned approved copies to the contractor.

1.7 PRODUCT DATA

A. Submit the number of copies which the Contractor requires, plus three (3) copies which will be retained by the Engineer.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.

C. Indicate Product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in the General Conditions.

1.8 MANUFACTURERS' INSTRUCTIONS

A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

C. Identify conflicts between manufacturers' instructions and Contract Documents.

1.9 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification Sections, submit manufacturer's certificate to Engineer for review, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

1.10 CONSTRUCTION PHOTOGRAPHS

A. Recommended for evaluation of the existing facility after completion of the project.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality assurance/control of installation.

B. References.

C. Construction observation and testing laboratory services.

D. Manufacturers' field services and reports.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals.

B. Section 01600 - Material and Equipment.

1.3 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply fully with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from the Engineer.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.4 REFERENCES

A. Conform to reference standard by date of issue current on date of Contract Documents.

B. Should specified reference standards conflict with Contract Documents, request clarification from Engineer.

C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.5 CONSTRUCTION OBSERVATION AND TESTING LABORATORY SERVICES

A. Owner will appoint and employ for services of Engineer to perform Construction Observation and testing.

B. The Engineer will observe all tests run by the Contractor in the field.

C. The Contractor shall be responsible for providing the equipment and manpower to assist the Engineer in taking tests.

D. The Contractor shall provide the equipment and manpower to conduct all tests as required in the specifications.

E. The Contractor shall notify the Engineer of the time in which tests are to be run forty-eight (48) hours prior to testing.

F. Reports will be submitted by the Engineer, to the Contractor indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

G. Cooperate with Engineer; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
   1. Notify Engineer 48 hours prior to expected time for operations requiring services.
   2. Make arrangements with Engineer and pay for additional samples and tests required for Contractor's use.

H. Retesting required because of non-conformance to specified requirements shall be performed by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the Contract Sum/Price.

1.6 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.

B. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

C. Submit report in duplicate within 15 days of observation to Engineer for review.

1.7 PROJECT LIMITS

A. Confine all equipment, tools, and materials to the easements and project sites shown on the plans. Access building with equipment at only one location.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 INSTALLATION

A. The contractor shall inspect material or equipment upon the arrival on the job site and immediately prior to installation and reject damaged and effective items.

B. The contractor shall verify measurements and dimensions of the work as an integral step of starting each installation.

C. Where installations include manufactured products the contractor shall comply with manufacturer applicable instruction and recommendation for installation, to whatever extent these are more explicit or more stringent than applicable requirement indicated in the Contract Documents.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 TEMPORARY SANITARY FACILITIES

A. Facilities are available at the site.

1.2 TEMPORARY ELECTRICITY

A. Provide, maintain and pay for temporary electricity as needed for construction. 120 V single phase electricity exists at the site for contractor use. Coordinate amperage and voltage to ensure adequacy for construction. Provide other sources if existing source is not adequate.

1.3 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of site, to protect public safety, and to protect existing facilities and adjacent properties from damage from construction operations.

B. Provide protection for plant life designated to remain. Replace damaged plant life.

C. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

1.4 WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment as needed.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion and puddling.

1.5 DUST CONTROL

A. This item shall consist of furnishing and applying POTABLE water required in construction and for dust control, in accordance with the requirements of these specifications.

B. Water, when required, shall be applied at the locations and in the amounts required to properly compact the work. An adequate water supply shall be provided by the Contractor. The equipment used for watering shall be of ample capacity and of such

design as to assure uniform application of water in the amounts required.

C. If required, watering shall be done at night or at other times when evaporation loss will be at a minimum.

D. In watering of subgrades, the Engineer may direct the Contractor to apply water in such quantities that the subgrade shall be compacted at a moisture content in excess of "optimum moisture." In no case will the Contractor be required to apply water in excess of three percent (3%) of optimum moisture.

E. The Contractor shall also apply water during the course of the work to control dust, maintaining all embankment and base courses in a damp condition.

F. The Contractor shall provide sufficient equipment to apply water as directed for controlling dust caused by construction activities. If dusty conditions continue to exist due to insufficient or inadequate watering practices or lack of watering equipment, it shall cause the closing down of those operations affected until remedied. Watering shall be done on Saturdays, Sundays, and Holidays at the same frequency and amounts as specified for work days at the Contractor's expense.

G. Watering equipment shall consist of water-tight tanks mounted on trucks, adequately powered, and capable of applying water as required. The water shall be applied under pressure from the tank through a spray apparatus as directed. The spray apparatus shall be equipped as to provide uniform, unbroken spread of water over the surface being watered. A suitable device for positive shut-off and for regulating the flow of water shall be located so as to permit positive drive control from the cab.

1.6 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize amount of bare soil exposed at one time.

C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosion of surface silts or clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation, promptly apply corrective measures.

1.7 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

B. Equipment and fuel storage shall be kept secured. Waste oil and waste fluids shall not be stored or changed at any construction site.

C. Prevent moist soil or other contaminants from being transferred into facilities.

D. Comply with **"Disinfection of Non-Hatchery Vehicles and Heavy Equipment Entering a Utah Division of Wildlife Resources Fish Hatchery"** attached to this section.

1.8 SECURITY

A. Provide security and facilities to protect work from unauthorized entry, vandalism or theft.

1.9 NOISE CONTROL

A. Construction involving noisy operations, including starting and warming up of equipment, shall be restricted to the hours between 7:00 a.m. and 7:00 p.m. on weekdays. Noisy operations shall be scheduled to minimize their duration and to ensure their completion by 7:00 p.m.

B. Notification of special circumstances or emergency conditions that require work beyond the hours specified above shall be provided as follows:

1. The Contractor shall notify the Engineer 48 hours in advance of any proposed extended work hours for preauthorization. Notification shall include a written request for authorization to perform work specified and the circumstances that warrant this request. This notification shall include any additional measures to mitigate noise generated by this construction activity if deemed necessary by the Engineer.
2. If an emergency situation occurs that warrants extended hours, the Contractor shall notify the Engineer immediately upon determining the need for this work.

1.10 TREE AND PLANT PROTECTION

A. CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS: All landscaped areas and other surface improvements which are damaged by actions of the Contractor shall be restored to a condition equal to or better than it was prior to

construction. Areas shall not be cleared until related construction activities require the work.

1.11 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification Sections.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.

1.12 ACCESS ROADS

A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.

B. Extend and relocate as Work progress requires. Provide detours necessary for impeded traffic flow in excess of two hours.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide and maintain access for emergency vehicles.

E. Provide means of removing mud from vehicle wheels before entering streets.

1.13 PARKING

A. Do not allow construction personnel to park in any way which may affect the access of emergency vehicles or hatchery personnel.

B. Arrange for temporary surface parking to accommodate construction personnel.

C. When site space is not adequate, provide additional off-site parking.

1.14 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove waste materials, debris, and rubbish from site periodically and dispose off-site in approved solid waste facilities at no additional cost to owner.

C. Provide necessary containment and clean-up of all hazardous/dangerous materials on-site that result from Contractor’s actions.

D. Dispose of all hazardous/dangerous waste in approved hazardous waste facilities that result from Contractor's actions.

1.15 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to Substantial Completion.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

State of Utah

Department of Natural Resources

MICHAEL R. STYLER
Executive Director

Division of Wildlife Resources

JAMES F. KARPOWITZ
Division Director

Disinfection of Non-Hatchery Vehicles and Heavy Equipment Entering a Utah Division of Wildlife Resources Fish Hatchery

Due to the possibility of introducing a disease or unwanted organisms to our facility during construction all equipment will need to be cleaned and disinfected before being brought onto the hatchery grounds. The possibility of introducing disease and Aquatic Nuisance Species are a major concern, but viruses, fungus, parasites and bacterial diseases are also a concern.

Whirling disease and the Aquatic/Terrestrial Nuisance Species, especially New Zealand mud snail, are now found statewide. If one of these organisms happened to be introduced into a hatchery, the facility would be shut down for an indefinite period of time, with the possibility of ending trout production forever.

The following are protocols for bringing vehicles, heavy equipment and non-fish culture personnel and equipment onto a Division Fish Culture Facility will be followed for all agencies/companies and their employees:

The construction field supervisor is responsible for notifying the Hatchery Supervisor of any vehicles entering the facility for the first time. If the Supervisor is not available another hatchery staff members will be designated to act in his place. The designated hatchery staff member will inspect all vehicles and heavy equipment before entering the facility where fish are being reared. Our main concern is to insure that all equipment is free of mud and dirt, etc. that may harbor disease or Aquatic Nuisance Species.

The following must be done:

1. The day before any vehicles or heavy equipment are brought onto the station, they will need to be washed and allowed to dry overnight. All mud or clumps of dirt need to be removed. Washing by a hot water pressure washer is preferred. If the vehicles have been working around a lake, river or pond they will need to be disinfected. This has to be done with a 1000-ppm solution of chlorine, which will be sprayed onto the vehicle after it has been washed. Spray chlorine on the entire vehicle paying particular attention to the vehicle's underside, tires and wheels. A 1,000-ppm solution is 72 milliliters of household bleach/gallon of water. Rinse the chlorine off of the vehicle afterwards.

2. Vehicles leaving hatchery grounds and going to a landfill, then returning to the hatchery will not need to be washed again. If they are muddy, the vehicle will need to be washed and be free of mud before entering the hatchery grounds.

3. All vehicles or heavy equipment leaving the hatchery will not need to be washed again when returning, as long as they do not go into muddy areas or waterways. When the heavy equipment is brought back onto the site, a designated hatchery employee will need to inspect it.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products.

B. Transportation and Handling.

C. Product Delivery

D. Storage and protection.

E. Product options.

F. Proposed Substitutions or “or equal” Item.

G. Owner furnished equipment.

1.2 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.

B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

C. Provide interchangeable components of the same manufacturer, for similar components where more than one choice is available.

1.3 PRODUCT DELIVERY

A. STATE OF UTAH will not accept any deliveries addressed to CONTRACTOR or its Subcontractors.

1.4 TRANSPORTATION AND HANDLING

A. Transport and handle products in accordance with manufacturer's instructions and deliver to project site in undamaged condition in manufacturer’s unopened containers and packaging.

B. Promptly review shipments to assure that products comply with requirements, quantities are correct, and products are undamaged. Replace damaged products

at no additional cost to OWNER.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

D. The contractor shall provide additional protection during handling to prevent marring and otherwise damaging product, packaging and surrounding surfaces.

1.5 STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.

B. For exterior storage of fabricated products, place on sloped supports, above ground.

C. Provide off-site storage and protection when site does not permit on-site storage or protection.

D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

G. Arrange storage of products to permit access for review. Periodically review to assure products are undamaged and are maintained under specified conditions.

1.6 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

1.7 PROPOSED SUBSTITUTIONS OR “OR EQUAL” ITEM

A. Whenever materials or equipment are indicated in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the naming of the item is intended to establish the type, function, and quality required. If the name is followed by the words “or equal” indicating that a substitution is permitted, materials or equipment of other suppliers may be accepted if sufficient information is submitted by the CONTRACTOR to allow the ENGINEER to determine that the material or equipment proposed is equivalent or equal to that

named, subject to the following requirements:

PART 1 The burden of proof as to the type, function, and quality of any such substitution product, material or equipment shall be upon the CONTRACTOR

PART 2 The ENGINEER will be the sole judge as to the type, function, and quality of any such substitution and the ENGINEER's decision shall be final.

PART 3 The ENGINEER may require the CONTRACTOR to furnish additional data about the proposed substitution.

PART 4 The STATE OF UTAH may require the CONTRACTOR to furnish a special performance guarantee or other surety with respect to any substitution.

PART 5 Acceptance by the ENGINEER of a substitution item proposed by the CONTRACTOR shall not relieve the CONTRACTOR of the responsibility for full compliance with the Contract Documents and for adequacy of the substitution.

PART 6 The CONTRACTOR shall be responsible for resultant changes which the accepted substitution requires in the CONTRACTOR'S WORK, the WORK of its subcontractor and of other contractors.

B. The procedure for review by the ENGINEER will include the following:

1. If the CONTRACTOR wishes to provide a substitution item, the CONTRACTOR shall make written application to the ENGINEER on the "Substitution Request Form."

2. Unless otherwise provided by law or authorized in writing by the ENGINEER, the "Substitution Request Form(s) shall be within the 30 day period after award of the Contract.

3. Wherever a proposed substitution item has not been submitted within said 30-day period, or wherever the submission of a proposed substitution material or equipment has been judged to be unacceptable by the ENGINEER, the CONTRACTOR shall provide the material or equipment indicated in the Contract Documents.

4. The CONTRACTOR shall certify that the proposed will perform adequately the functions and achieve the results called for by the general design, and be similar and of equal substance to that indicated, and be suited to the same use as that specified.

5. The ENGINEER will evaluate each proposed substitution within a reasonable period of time.

6. As applicable, no shop drawing submittals shall be made for a substitution item nor shall any substitution item be ordered, installed, or utilized with out the ENGINEER's prior written acceptance of the CONTRACTOR's "Substitution Request Form."

7. The ENGINEER will record the time required by the ENGINEER in evaluating substitutions proposed by the CONTRACTOR and in making changes by the CONTRACTOR in the Contract Documents occasioned thereby.

C. The CONTRACTOR's application using the "Substitution Request Form" shall contain the following statements and information which shall be considered by the ENGINEER in evaluating the proposed substitution:

1. The evaluation and acceptance of the proposed substitution will not prejudice the CONTRACTOR's achievement of substantial completion on time.

2. Whether or not acceptance of the substitution for use in the WORK will require a change in any of the Contract Documents to adopt the design to the proposed substitution.

3. Whether or not incorporation or use of the substitution in connection with the WORK is subject to payment of any license fee or royalty.

4. All Variations of the proposed substitution from the items originally specified will be identified.

5. Available maintenance, repair, and replacement services will be indicated. The manufacturer shall have a local service agency (within 100 miles of the site) which maintains properly trained personnel and adequate spare parts and is able to respond and complete repairs within 24 hours.

6. Itemized estimate of all costs that will result directly or indirectly from acceptance of such substitution, including cost of redesign and claims of other contractors affected by the resulting change.

D. Without any increase in cost to the STATE OF UTAH, the CONTRACTOR shall be responsible for and pay all costs in connection with proposed substitutions and of inspections and testing of equipment or materials submitted for review prior to the CONTRACTOR's purchase thereof for incorporation in the WORK, whether or not the ENGINEER accepts the proposed equipment or material. The CONTRACTOR shall reimburse the STATE OF UTAH for the charges of the ENGINEER for evaluating each proposed substitution.

1.8 OWNER FURNISHED EQUIPMENT

A. Fiberglass reinforced plastic tanks per section 13209 are state furnished and will be delivered to the site for unloading and installation by the contractor.

B. Coordinate delivery times with the Division of Wildlife Resources.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Starting of systems.

D. Demonstration and instructions.

E. Testing, adjusting and balancing.

F. Protecting installed construction.

G. Project record documents.

H. Operation and maintenance data.

I. Manual for materials and finishes.

J. Manual for equipment and systems.

K. Spare parts and maintenance products.

L. Product warranties and product bonds.

1.2 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer's review.

B. Provide submittals to Architect/Engineer required by authorities having jurisdiction.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

D. Owner will occupy all of building as specified in Section 01100.

1.3 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces,

C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.

D. Clean filters of operating equipment.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Clean site; sweep paved areas, rake clean landscaped surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 STARTING OF SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Architect/Engineer seven days prior to start-up of each item.

C. Verify each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable manufacturer's representative and / or Contractors' personnel in accordance with manufacturers' instructions.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

H. Submit a written report in accordance with Section 01300 that equipment or system has been properly installed and is functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner's personnel one weeks prior to date of Substantial Completion.

B. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.

D. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

E. Required instruction time for each item of equipment and system is specified in individual sections.

1.6 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas. Unless areas are designated access locations.

1.7 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed Shop Drawings, Product Data, and Samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

G. Submit documents to Architect/Engineer with claim for final Application for Payment.

1.8 OPERATION AND MAINTENANCE DATA

A. Submit data bound in 8-1/2 x 11 inch (A4) text pages, three D side ring binders with durable plastic covers.

B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

E. Contents: Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.

f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

3. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and product data.
   b. Air and water balance reports.
   c. Certificates.
   d. Photocopies of warranties and bonds.

1.9 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Architect/Engineer comments. Revise content of document sets as required prior to final submission.

D. Submit two sets of revised final volumes in final form within 10 days after final inspection.

E. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

F. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

G. Include color coded wiring diagrams as installed.

H. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and special operating instructions.

I. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

J. Include servicing and lubrication schedule, and list of lubricants required.

K. Include manufacturer's printed operation and maintenance instructions.

L. Include sequence of operation by controls manufacturer.

M. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

N. Include control diagrams by controls manufacturer as installed.

O. Include Contractor's coordination drawings, with color coded piping diagrams as installed.

P. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

Q. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

R. Include test and balancing reports as specified in Section 01400.

S. Additional Requirements: As specified in individual product specification sections.

T. Include listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

1.10 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

1.11 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include Table of Contents and assemble in three D side ring binder with durable plastic cover.

F. Submit prior to final Application for Payment.

G. Time Of Submittals:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
   2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02125

MINOR DEMOLITION FOR REMODELING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Demolishing designated building equipment and fixtures.
2. Demolishing designated construction.
3. Cutting and alterations for completion of the Work.
4. Removing designated items for reuse and Owner's retention.
5. Protecting items designated to remain.
6. Removing demolished materials.

B. Related Sections:
1. Section 02512 - Site Water Distribution: Re-furbishing and re-installing of removed materials.

1.2 SUBMITTALS

A. Section 01330 - Submittal Procedures: Requirements for submittals.

B. Demolition Schedule: Indicate overall schedule and interruptions required for utility and building services.

C. Shop Drawings:
1. Indicate demolition and removal sequence.
2. Indicate location and construction of temporary work.

1.3 CLOSEOUT SUBMITTALS

A. Section 01700 - Execution Requirements: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations of capped utilities, concealed utilities discovered during demolition, subsurface obstructions, and.

C. Operation and Maintenance Data: Submit description of system, inspection data, and parts lists.

1.4 QUALITY ASSURANCE

A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection.

B. Conform to applicable code for procedures when hazardous or contaminated materials are discovered.

1.5 SEQUENCING

A. Section 01100 - Summary: Requirements for sequencing.

B. Sequence activities in the following order:
1. Enlarge doorways for access.
2. Remove concrete raceways.
3. Salvage valves and reusable piping
4. Remove unused piping and water troughs

C. Owner will conduct salvage operations before demolition begins to remove materials Owner chooses to retain.

1.6 SCHEDULING

A. Section 01300 - Administrative Requirements: Requirements for scheduling.

B. Schedule Work to coincide with new construction.

C. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation and in adjoining spaces.

D. Perform noisy, work:
1. Between hours of 7 A.M. and 7 P.M.

E. Coordinate utility and building service interruptions with Owner.
1. Schedule tie-ins to existing systems to minimize disruption.

1.7 PROJECT CONDITIONS

A. Cease operations immediately if structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

A. Notify affected utility companies before starting work and comply with their requirements.

B. Mark location and termination of utilities.

C. Erect, and maintain temporary barriers and security devices, including warning signs and lights, and similar measures, for protection of the public, Owner, and existing improvements indicated to remain.

D. Prevent movement of structure; provide temporary bracing and shoring required to ensure safety of existing structure.

3.2 SALVAGE REQUIREMENTS

A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner.

B. Tag components and equipment Owner designates for salvage.

C. Protect designated salvage items from demolition operations until items can be removed.

D. Carefully remove building components and equipment indicated to be salvaged.

E. Disassemble as required to permit removal from building.

F. Package small and loose parts to avoid loss.

G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.

H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.

I. Deliver salvaged items to Owner. Obtain signed receipt from Owner.

3.3 DEMOLITION

A. Do not close or obstruct roadways without permits.

B. Cease operations immediately when structure appears to be in danger and notify Architect/Engineer.

C. Disconnect and remove utilities within demolition areas.

D. Cap and identify abandoned utilities at termination points when utility is not completely removed. Annotate Record Drawings indicating location and type of service for capped utilities remaining after demolition.

E. Demolish in orderly and careful manner. Protect existing improvements, supporting structural members.

F. Carefully remove building components indicated to be reused.

1. Disassemble components as required to permit removal.
2. Package small and loose parts to avoid loss.
3. Mark components and packaged parts to permit reinstallation.
4. Store components, protected from construction operations, until reinstalled.

G. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

H. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.

I. Remove temporary Work.

3.4 SCHEDULES

A. Owner will remove the following material and equipment before start of demolition:
1. Equipment and materials not to be removed during demolition.
2. 1 ½" ball valves

B. Protect the following materials and equipment remaining:
1. Doorways.
2. Structural Headers.
3. Interior Wall finishes.

C. Demolish, remove and dispose of the following materials and equipment:
1. All concrete raceways in the building.
2. Concrete floor and drains as noted on the plans.
3. Piping as noted on the drawings.

END OF SECTION

SECTION 02140

DEWATERING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

A. Trench Dewatering.

B. Dewatering for Structures.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control.

B. Section 01500 - Construction Facilities and Temporary Controls.

C. Section 02225 - Trenching and Backfilling for Utilities.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 PREPARATION

A. Furnish, install and operate all necessary machinery, appliances and equipment to maintain all excavations and trenches free from water during construction.

3.2 DEWATERING

A. Dispose of water in such a manner that it does not cause injury to public or private property, or cause a nuisance or a menace to the general public.

B. Comply with State of Utah, Water Quality Standards, latest edition, for discharge of water to surface water.

C. The Contractor shall be fully responsible for complying with the permitting performance requirements. Contractor may devise dewatering system to achieve such requirements. It is

anticipated that well point methods, stilling basins, geotextile dams, straw bails, silt fences, or siltation channels will be required to meet performance stipulations of the reference permits. Such temporary facilities can be constructed on-site, and will be required to be removed after completion.

D. Draw static water level to at least one foot (1') below the bottom of the excavation prior to excavation to maintain the undisturbed state of the foundation soils and allow placement of bedding material and backfill to the required density.

E. Compact native soil prior to placing backfill or foundation material according to Section 02223 of these specifications.

F. Prevent softening of the bottom of excavations and the formation of "quick" conditions or "boils" during excavation.

G. Additional cost for trench bottom stabilization, due to inadequate dewatering system, will be incidental to the work.

H. Control surface runoff to prevent entry or collection of water in excavations.

I. Install and operate the dewatering system so that adjacent structures or property are not endangered by the reduction in the groundwater level.

3.3 TERMINATION

A. Allow groundwater to return to static level to maintain the undisturbed state of the natural foundation soils, prevent disturbance of the compacted backfill, and prevent flotation or movement of structures and gravity or pressure pipe.

3.4 TESTING

A. Monitor wastewater from dewatering operations for changes in visual or odor components indicating the presence of contaminants including, but not limited to, gasoline, pesticides and other hazardous materials and toxins.

B. Cease dewatering operations and notify Engineer, and regulatory agencies, immediately upon encountering contaminants in water.

C. Maintain explosive atmosphere-detection device on-site. Periodically measure atmosphere for explosivity at mid-height of excavation.

END OF SECTION

SECTION 02205

SOIL MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Trench Backfill Soil Materials.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control.

B. Section 02222 - Excavation.

C. Section 02223 - Backfilling.

D. Section 02231 - Aggregate Base Course.

1.3 REFERENCES

A. ASTM D2487 - Classification of Soils for Engineering Purposes.

B. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

C. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures in place by Nuclear Methods (Shallow Depth).

D. AASHTO T-180 - Moisture-Density Relations of Soils Using a 10-lb Rammer and eighteen (18) inch Drop.

E. ANSI/ASTM D-1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer with an eighteen (18) inch drop.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Samples: Submit, in airtight containers, 45 lb. (20 kg) sample of each type of imported trench backfill to testing laboratory.

C. Materials Source: Submit name of imported materials suppliers. Provide materials from same source throughout the work. Change of source requires Engineer's approval.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Subsoil Type S1: Excavated and re-used material, graded, free of lumps larger than 4 inches, rocks larger than 4 inches, frozen material, and debris.

B. Use Subsoil Type S1 for trench backfill and structure backfill.

2.2 SOURCE QUALITY CONTROL

A. Inspection and testing will be performed under provisions of Section 01400.

B. Tests and analysis of soil material will be performed in accordance with AASHTO T-180, ASTM D2922, ANSI/ASTM D-1557, ANSI/ASTM D-698, and ASTM D3017. A minimum of three tests must be done.

C. If tests indicate materials do not meet specified requirements, change material and retest at no cost to Owner.

PART 3 EXECUTION

3.1 STOCKPILING

A. Stockpile materials on site.

B. Stockpile in sufficient quantities to meet project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

A. Remove stockpile, leave area in a clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 02207

AGGREGATE MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aggregate materials for pipe bedding, import fill, and drain rock.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals.

B. Section 01400 - Quality Requirements.

C. Section 02225 – Trenching and Backfilling for Pipelines.

1.3 REFERENCES

A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ASTM D2049 - Test Method for Relative Density of Cohesionless Soils.

C. ASTM D2487 - Classification of Soils for Engineering Purposes.

D. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

E. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

F. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures in place by Nuclear Methods (Shallow Depth).

H. ANSI/ASTM D-1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer with an eighteen (18) inch drop.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Samples: Submit, in airtight containers, 45 lb. (20 kg) sample of each type of aggregate material to testing laboratory. Submit test results to Engineer.

C. Materials Source: Submit name of aggregate materials suppliers. Provide materials

from same source throughout the work. Change of source requires Engineer approval.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS

A. Aggregate Type A1: Natural stone or crushed rock; free of clay, shale, organic matter; graded in accordance with ANSI/ASTM C136, ASTM D2487 Group Symbol GM GC; to the following limits:

1. Minimum Size: 1 inch (25 mm)
2. Maximum Size: 2 inch (50 mm)

Use for trench foundation material, as indicated on the Drawings.

B. Aggregate Type A2: Crushed rock; free of clay, shale, organic matter; graded in accordance with ANSI/ASTM C136, ASTM D2487 Group Symbol GM GC; to the following limits:

3. Minimum Size: #4 Sieve
4. Maximum Size: 3/4 inch

Use for crushed rock filler between concrete slabs.

C. Coarse Aggregate Type A4: ¾ inch minus angular, crushed, free of shale, clay, friable material and debris; graded in accordance with ANSI/ASTM C136; within the following limits: (Alternative gradations will be considered)

Sieve Size	Percent Passing
3/4 inch	100
1/2 inch	75 to 95
3/8 inch	65 to 85
No. 4	40 to 65
No. 10	25 to 50
No. 50	10 to 25
No. 200	2 to 8

Use for pipe bedding material, pipe zone backfill and as shown on the Drawings.

D. Aggregate Type A6: Native material, free of organic material, friable materials and debris. Maximum allowable size is four (4) inches.

Use for trench backfill and structure backfill.

2.2 SOURCE QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01400.

B. Tests and analysis of aggregate material will be performed in accordance with ASTM C136 and ASTM D2487. A minimum of three (3) tests of each material source must be done.

C. If tests indicate materials do not meet specified requirements, change material and retest at no cost to Owner.

PART 3 EXECUTION

3.1 STOCKPILING

A. Stockpile materials on site.

B. Stockpile in sufficient quantities to meet project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

E. Upon removal, do not mix material with native materials.

3.2 STOCKPILE CLEANUP

A. Remove stockpile, leave area in a clean and neat condition. Grade site surface to prevent freestanding surface water.

END OF SECTION

SECTION 02225

TRENCHING AND BACKFILLING FOR PIPELINES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavation for pipelines.

B. Compacted bedding over pipelines.

C. Backfilling and compaction.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control

B. Section 01500 - Construction Facilities and Temporary Controls

C. Section 02140 – Dewatering.

D. Section 02512 – Site Water Distribution.

1.3 REFERENCES

A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ANSI/ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.

C. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

D. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

1.5 FIELD MEASUREMENTS

A. Verify that survey bench mark and intended elevations for the Work are as shown on drawings.

PART 2 PRODUCTS

2.1 BACKFILL MATERIALS

A. Soil Materials: Subsoil Type S1 as specified in Section 02205.

B. Aggregate Materials: Type A4 or A6 as specified in Section 02207.

2.2 BEDDING MATERIALS

A. Type B1 - Pea Gravel: Natural stone; free of clay, shale, organic matter; graded in accordance with ANSI/ASTM C136, to the following:
1. Minimum Size: 1/4 inch
2. Maximum Size: 5/8 inch.

B. Type B2 - Sand: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, or organic matter; uniform in size with no material larger than 3/4".

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify fill materials to be reused if acceptable.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Identify, maintain and protect existing utilities remaining, which pass through work area.

C. Protect bench marks, existing structures, sidewalks, paving, and curbs from excavation equipment and vehicular traffic.

D. Protect above and below grade utilities which are to remain.

E. Cut out soft areas of subgrade not capable of in situ compaction. Backfill with Type A1 fill, Section 02207, and compact to density equal to or greater than requirements for subsequent backfill material to a point 4" below the bottom of the pipe.

F. Provide means by which natural drainage ways can be diverted away during

trenching. Do not permit runoff water to enter the trench.

3.3 EXCAVATION

A. Underpin adjacent structures which may be damaged by excavation.

B. Have utility poles supported which may become undermined by excavation.

C. Excavate subsoil required for water piping, sewer piping, culverts and other utilities.

D. Cut trenches sufficiently wide to enable safe installation of utilities and allow review, meeting dimensions shown on the plans. Minimize the length of open trenches.

E. Excavation shall not interfere with normal 45 degree bearing splay of foundations.

F. Provide trench bracing in strict accordance to safety standards.

G. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

H. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd, measured by volume.

I. Correct unauthorized excavation using suitable backfill materials, at no cost to the Owner.

J. Correct areas over excavated by error using suitable backfill materials, at no cost to the Owner.

K. Stockpile excavated material in area designated on site.

L. Provide means for removing ground water from trench. No pipe shall be laid in a trench with standing water in it.

M. Sawcut concrete where required for installation.

3.4 BEDDING

A. Support pipe and conduit during placement and compaction of bedding.

B. Install bedding material to 12” above pipe or bottom of concrete slab. Minimum beneath concrete slabs, 4 inches unless approved by the Engineer.

3.5 BACKFILLING

A. Backfill trenches to contours and elevations with unfrozen materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

C. Granular Fill: Place and compact materials in continuous layers not exceeding 8 inches loose depth.

D. Soil Fill: Place and compact material in continuous layers not exceeding 8 inches loose depth.

E. Employ a placement method that does not disturb or damage pipe in trench.

F. Maintain moisture content within 2% of optimum moisture content for fill materials to attain required compaction density.

G. Leave fill material stockpile areas completely free of excess fill materials.

H. Install magnetic locator tape 12” above pipe surface at exterior locations.

3.6 FIELD QUALITY CONTROL

A. Field review and testing will be performed under provisions of Section 01400.

B. Tests and analysis of fill material if required by Engineer will be performed in accordance with ANSI/ASTM C136 and with Section 01400.

C. Compaction testing if required by Engineer will be performed in accordance with ANSI/ASTM D1556, ANSI/ASTM D1557, and with Section 01400.

D. If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest at no cost to the Owner.

3.7 PROTECTION OF FINISHED WORK

A. Protect trench excavation to prevent cave in.

B. Maintain and protect finished Work until project is completed.

C. Recompact fills subjected to vehicular traffic.

3.8 SCHEDULE

A. Water lines, gravity sewer pipe, and conduits under pavement or structures:

1. Bedding Fill: Type B1 or B2, or Type A4; 4 inches under pipe to 6 inches over

pipe, compacted to 95 percent of maximum dry density in accordance with ANSI/ASTM D1557.

2. Backfill: Subsoil Type S1 (Section 02205); if native material is unacceptable, Type A4 or A6 (Section 02207). Compaction 95% per ASTM D1557.

B. Water lines, gravity sewer pipe, and conduits at all other locations:

1. Bedding Fill: Type B1 or B2, or Type A4; 4 inches under pipe to 6 inches over pipe, compacted to 92 percent of maximum dry density in accordance with ANSI/ASTM D1557.

2. Backfill: Subsoil Type S1 (Section 02205); if native material is unacceptable, Type A4 or A6 (Section 02207). Compaction 92% per ASTM D1557.

END OF SECTION

SECTION 02512

SITE WATER DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Pipe and fittings for aquaculture water lines to the hatchery building.
2. Valves.
3. Underground pipe markers.
4. Bedding and cover materials.

B. Related Sections:
1. Section 02207- Aggregate: Aggregate for backfill in trenches.
2. Section 02225 – Trench Excavation and Backfill: Product and execution requirements for excavation and backfill required by this section.
3. Section 03300 - Cast-in-Place Concrete: Concrete floor.

1.2 REFERENCES

A. ASTM International:
1. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
2. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
3. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
4. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
5. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on pipe materials, pipe fittings, valves and accessories.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

D. Installers documented experience.

6. Lugs stainless steel or zinc plated steel.
7. 150 P.S.I. pressure rating @73° F.

2.3 UNDERGROUND PIPE MARKERS

A. Magnetic Locator Tape: Identification tape shall be furnished with white or black printing on a blue color field having the words CAUTION: Name of Utility - BELOW. All pipe shall include a 3-inch magnetic locator tape installed in the pipeline trench approximately 12 inches below ground surface.

2.4 BEDDING AND COVER MATERIALS

A. Bedding: Fill Type A4, B1, B2 as specified in Section 02207, 02225.

B. Cover: Fill Type A4, A6, as specified in Section 02207.

C. Soil Backfill from Above Pipe to Finish Grade: Soil Type S1, as specified in Section 02205.

2.5 ACCESSORIES

A. Link Seal or equal

B. Pipe Supports/ Restraints
1. Restraints – Metal or Plastic Strapping with concrete anchors at all supports to prevent lateral movement of the pipe during operation and earthquakes.
2. Wood Bearing Plates
   a. Redwood or treated 2x material per 06112

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify elevations of pipe and structures confer with plans.

3.2 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

1.4 CLOSEOUT SUBMITTALS

A. Section 01700 - Execution Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 QUALITY ASSURANCE

A. Pipe welding to be performed by a contractor with 3 years experience and specific experience in welded saddle installation.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Deliver and store valves in shipping containers with labeling in place.

PART 2 PRODUCTS

2.1 WATER PIPING

A. PVC Pipe: ASTM D1785, Schedule 40,:
   1. Fittings: ASTM D2466, PVC.
   2. Joints: ASTM D2855, solvent weld
   3. Application: Aquaculture site piping

2.2 VALVES

A. Ball Valves
   1. PVC Type I Cell Classification 12454.
   2. EPDM O Rings.
   3. Double stop polypropylene handle.
   4. NSF approved.
   5. 150 P.S.I. pressure rating @ 73° F.

B. Butterfly Valves
   1. PVC Type I Cell Classification 12454.
   2. Valve seats – Buna-N, EPDM, Viton.
   3. Bolt Pattern – ANSI ASME B-16.5 CL150.
   4. Disc – Offset, 316 stainless steel stem, 2 O-ring seals.
   5. Poly Propylene Handle.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 02225 for Work of this Section.

B. Backfill around sides and to top of pipe in accordance with Section 02225.

C. Maintain optimum moisture content of fill material to attain required compaction density.

D. Place fill material in accordance with Section 02225.

3.4 INSTALLATION - PIPE

A. Route pipe in straight line.

B. Install pipe to allow for expansion and contraction without stressing pipe or joints.

C. Backfill trench in accordance with Section 02225.

3.5 INSTALLATION - VALVES

A. Install in orientation noted on the plans.

B. Position for full actuation of the handle.

3.6 Pipe Supports

A. Install wood bearing plates with construction adhesive to concrete bearing locations.

B. Install additional pipe supports such that at no point spacing of bearing points is greater than 10 feet.

C. Install lateral restraints with end of strapping hemmed and anchored.

3.7 FIELD QUALITY CONTROL

A. Section 01400 - Quality Requirements 01700 - Execution Requirements: Field inspecting, testing, adjusting, and balancing.

B. Pressure test supply system to 20psi for 30 minutes. Repair leaks and re-test. No visible leakage will be permitted.

C. Compaction Testing for Bedding: In accordance with ASTM D1557. ASTM D2922. ASTM D3017.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

E. Frequency of Compaction Tests: One test per trench at midpoint and top of backfill. Spacing 50 feet.

F. Inspect head box for leaking after initial excavation. Coordinate with Engineer for repairs.

G. Test head box at operating water level for leaks at all penetrations and joints. Elapsed time 24 hours. Repair and retest until no visible leaks are present.

END OF SECTION

SECTION 03100

CONCRETE FORMS AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Formwork for cast-in place concrete.
2. Form accessories.
3. Form stripping.

B. Related Sections:
1. Section 03300 - Cast-in-Place Concrete.
2. Section 05500 - Metal Fabrications: Product requirements for metal fabrications for placement by this Section.

1.2 REFERENCES

A. American Concrete Institute:
1. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 318 - Building Code Requirements for Structural Concrete.
4. ACI 347 - Guide to Formwork for Concrete.

B. ASTM International:
1. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 318.

B. For wood products furnished for work of this Section, comply with AF&PA.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Products storage and handling requirements.

1.5 COORDINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Coordinate this Section with other sections of work, requiring attachment of components to formwork.

PART 2 PRODUCTS

2.1 WOOD FORM MATERIALS

A. Form Materials: At discretion of Contractor to meet tolerances.

2.2 FORMWORK ACCESSORIES

A. Form Anchors and Hangers:
   1. Do not use anchors and hangers exposed concrete leaving exposed metal at concrete surface.
   2. Symmetrically arrange hangers supporting forms from structural steel members to minimize twisting or rotation of member.
   3. Penetration of structural steel members is not permitted.

B. Form Release Agent: Colorless mineral oil that will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.
   1. Manufacturers:
      a. Arcal Chemical Corporation Arcal-80.
      b. Industrial Synthetics Company Synthex.
      c. Nox-Crete Company Nox-Crete Form Coating.
      d. Substitutions: Section 01600 - Product Requirements.

C. Corners: Chamfer, type; 1 x 1 inch size; maximum possible lengths.

D. Bituminous Joint Filler: ASTM D1751.

E. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength and character to maintain formwork in place while placing concrete.

F. Sill Gasket – 4” polyethylene foam for surrounding PVC pipe penetrations.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with Drawings.

C. When formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Architect/Engineer.

3.2 INSTALLATION

A. Formwork - General:
1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
3. Camber forms where necessary to produce level finished soffits unless otherwise shown on Drawings.
4. Carefully verify horizontal and vertical positions of forms. Correct misaligned or misplaced forms before placing concrete.
5. Complete wedging and bracing before placing concrete.

B. Forms for Smooth Finish Concrete:
1. Use steel, plywood or lined board forms.
2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
3. Install form lining with close-fitting square joints between separate sheets without springing into place.
4. Use full size sheets of form lines and plywood wherever possible.
5. Use care in forming and stripping wood forms to protect corners and edges.
6. Level and continue horizontal joints.
7. Keep wood forms wet until stripped.

C. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301.

D. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

E. Obtain Architect/Engineer’s approval before framing openings in structural members not indicated on Drawings.

F. Install chamfer strips on external corners of walls.

3.3 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

D. Reuse and Coating of Forms: Thoroughly clean forms and reapply form coating before each reuse. For exposed work, do not reuse forms with damaged faces or edges. Apply form coating to forms in accordance with manufacturer's specifications. Do not coat forms for concrete indicated to receive "scored finish". Apply form coatings before placing reinforcing steel.

3.4 INSTALLATION - INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Install formed openings for items to be embedded in or passing through concrete work.

B. Locate and set in place items required to be cast directly into concrete.

C. Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

D. Install accessories straight, level, and plumb. Ensure items are not disturbed during concrete placement.

E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

F. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

G. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.

H. Construction Joints:
1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints.
2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
3. Show no overlapping of construction joints. Construct joints to present same appearance as butted plywood joints.
4. Arrange joints in continuous line straight, true and sharp.

I. Embedded Items:

1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
2. Do not embed wood or uncoated aluminum in concrete.
3. Obtain installation and setting information for embedded items furnished under other Specification sections.
4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
5. Verify conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318, Section 6.3.

J. Openings for Items Passing Through Concrete:
1. Frame openings in concrete where indicated on Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
2. Coordinate work to avoid cutting and patching of concrete after placement.
3. Perform cutting and repairing of concrete required as result of failure to provide required openings.

K. Screeds:
1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs.
2. Slope slabs to drain where required or as shown on Drawings.
3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms. Remove freestanding water.
4. Install sill seal around PVC penetrations.

L. Screed Supports:
1. For concrete over waterproof membranes and vapor barrier membranes, use cradle, pad or base type screed supports which will not puncture membrane.
2. Staking through membrane is not be permitted.

M. Cleanouts and Access Panels:
1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris and waste material.
2. Clean forms and surfaces against which concrete is to be placed. Remove chips, saw dust and other debris. Thoroughly blow out forms with compressed air just before concrete is placed.

3.5 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.6 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads and removal has been approved by Architect/Engineer.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

D. Leave forms in place for minimum number of days as specified in ACI 347.

3.7 ERECTION TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 301.

B. Tolerances: Construct formwork to produce completed concrete surfaces within construction tolerances as follows:
1. Walls: ¼” per 10’
2. Floors: ¼” per 10’
3. All other concrete: as specified in ACI 117.

3.8 FIELD QUALITY CONTROL

A. Section 01400 - Quality Requirements 01700 - Execution Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

C. Notify Architect/Engineer after placement of reinforcing steel in forms, but prior to placing concrete.

D. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION

SECTION 03251

EXPANSION AND CONSTRUCTION JOINTS

PART 1 GENERAL

1.1 WORK INCLUDED

Work necessary to furnish and install, complete, the expansion, construction, and control joints including premolded, pourable, and gun grade fillers.

1.2 RELATED WORK SPECIFIED UNDER OTHER SECTIONS

A. Submittals: Section 01300.

B. Concrete and Grout: Section 03300.

C. Saw-cut Control Joints: Section 03300.

1.3 SUBMITTALS

A. Product Data: Furnish for the following:

1. Joint fillers for horizontal and sloped joints.
2. Preformed control joints.
3. Water stop.
4. Adhered strip seal.
5. Sealants.

B. Shop Drawings: Furnish information listed below:

1. Construction Joints: Layout and location indicating type to be used.

C. Quality Control submittals: Furnish the following documents:

1. Water stop manufacturer's written instructions for product shipment, storage, handling, installation and repair.
2. Water stop manufacturer's written instructions for product shipment, storage, handling, installation and repair.
3. Adhered strip seal manufacturer’s written instructions for product shipment, storage, handling, application, and repair.
4. Submit placement shop drawings showing the location and type of all joints for each structure.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: Prepare and protect materials for shipment in accordance with manufacturer's recommendations.

B. Acceptance at Site: Verify that water stops delivered meet the cross-section dimensions shown and manufacturers reviewed product data prior to unloading and storage at the site.

C. Protect hydrophilic waterstop from premature exposure to moisture which may cause premature swelling of waterstop. Protect from oil, dirt, and sunlight.

PART 2 PRODUCTS

2.1 GENERAL

A. All joint material specified herein shall be classified as acceptable for potable water use, by the Environmental Protection Agency, within 30 days of application

2.2 BOND BREAKER TAPE FOR EXPANSION JOINT

A. Adhesive-backed glazed butyl or polyethylene tape which will adhere to the premolded joint material or concrete surface.

B. Width: Same as the joint.

C. Location: As shown.

2.3 BOND BREAKER

A. Provide either bond breaker tape as hereinbefore specified or a bond prevention material, nonstaining type, as specified in Section 03300, CONCRETE, except where a tape is specifically called for.

2.4 BACKING ROD

A. Backing rod shall be an extruded closed-cell, polyethylene foam rod. The material shall be compatible with the joint sealant material used and shall have a tensile strength of not less than 40 psi and o compression deflection of approximately 25 percent at 8 psi. The rod shall be 1.8 inch larger than the joint width except that one-inch diameter rod shall be used for ¾ inch wide joint.

2.5 JOINT FILLER (JF)

A. Joint Filler: ASTM D1751; Asphalt impregnated fiberboard or felt, 1/2 inch thick.

2.6 PREFORMED CONTROL JOINT

A. One-piece, flexible, polyvinyl chloride joint former; Kold-Seal Zip-Per Strip KSF-150-50-50, manufactured by Vinylex Corp., Knoxville, TN; or equal.

B. One-piece steel strip with preformed groove; Keyed Kold Retained Kap, manufactured by Burke Concrete Accessories, Inc., San Mateo, CA; or equal.

C. Provide in full-length unspliced pieces.

2.7 JOINT SEALANT

A. Joint sealant shall be approved for use in potable water supply systems. The specific gravity of the in-place filler after curing shall be greater than 1.0. The manufacturers of the following fillers shall provide written certification that the products are approved by the EPA and the State Department of Health for use in potable water supply systems, and will not be a hazard to health.

B. Manufacturers and Products:

1. Sikaflex 2C, Colonial White color only, as manufactured by Sika Chemical Company, Lyndhurst, NJ; submit product information for review and acceptance.

2. On sloping joints, use Gun Grade material of the above products of Sikaflex 1A similar nonsag material; submit product information for review and acceptance.

3. Or equal.

2.8 ACCESSORIES

A. Joint Sealant: Joint sealant shall be two-part polysulfide or urethane conforming to FS TT-S-00227. The type used shall be specifically intended for exterior, submerged control joint applications. A non-sag joint sealant shall be used for vertical joints and self-leveling for horizontal joints.

2.11 HYDROPHILIC WATERSTOP

A. Hydrophilic waterstop shall be a non-bentonite modified chloroprene rubber.

B. Manufacturers

1. Greenstreak- Hydrotite
2. Or equal

PART 3 EXECUTION

3.1 GENERAL

A. Locate joints as shown, or noted on the Drawings.

B. Verify conformance of water stops with dimensions shown and with reviewed product data prior to embedding water stops in concrete.

C. Construct straight joints; make vertical or horizontal, except where walls intersect sloping floors.

D. Commence concrete placement after the joint preparation is complete.

3.2 SURFACE PREPARATION

A. Construction Joints: Prior to placement of abutting concrete, clean contact surface:

1. Remove laitance and spillage from reinforcing steel and dowels.

2. Roughen surface to a minimum of ¼-inch amplitude:

a. Sandblast after the concrete has fully cured.

b. Water blast after the concrete has partially cured.

c. Green cut fresh concrete with high pressure water and hand tools.

3. Perform cleaning so as not to damage water stop, if one is present.

B. Expansion Joint with Joint Sealant:

1. Use motorized wire brush or other motorized device to mechanically roughen and thoroughly clean concrete surfaces on each side of joint from plastic water stop to the top of the joint.

2. Use clean and dry high pressure air to remove dust and foreign material, and dry joint.

3. Prime surfaces before placing joint filler.

C. Control Joint:

1. Coat concrete surfaces with bond breaker.

3.3 EXPANSION JOINT INSTALLATION

A. General:

1. Joint Sealant:

a. Sufficient in width to completely fill the joint space where shown.

2. Precut premolded joint filler to the required depth, as detailed, at locations were joint filler or sealant is to be applied.

3. Form cavities for joint filler with either precut, premolded joint filler, or smooth removable accurately-shaped material.

4. Vibrate concrete thoroughly along the joint form to produce a dense, smooth surface.

B. Pourable Joint Filler:

1. General: Install in accordance with the manufacturer's written instructions, except as specified below:

a. Apply primer prior to pouring joint filler.

b. Use masking tape on top of slabs at sides of joints; clean all spillage.

2. Place cold-applied, two-component fillers in accordance with manufacturer's written instructions.

3.4 CONTROL JOINT INSTALLATION

A. Concrete surface to be dense and smooth.

B. Install bond breaker to concrete surfaces above and below water stop.

3.5 PREFORMED CONTROL JOINTS

A. Use only where specifically shown.

B. Locate flush, or slightly below the top of slab.

C. Install in accordance with manufacturer's written instructions in straight, full-length unspliced pieces.

D. Steel Strip Type with Preformed Groove: Brace to with-stand pressure of concrete during and after placement.

3.6 INSTALLATION OF WATER STOPS

A. Hydrophilic Waterstop:

1. Inspect waterstop for premature swelling, discontinuity, and debris contamination prior to concrete placement. Replace unacceptable waterstop.

2. Adhere waterstop to concrete or other surfaces utilizing proper primer adhesive. For vertical applications, use nails in addition to the primer adhesive to secure waterstop to concrete.

3. Primer shall be allowed to dry for two hours prior to application of waterstop.

4. Apply waterstop the same day as primer adhesive.

5. Protect waterstop from moisture, dirt, oil, and sunlight during the progress of work.

6. Install waterstop with 2 inches minimum clear cover to concrete face.

7. Waterstop shall be butt spliced, pressing ends together ensuring no separation or air pockets.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete for the following:
   1. Slabs on grade.
   2. Control, expansion and contraction joint devices.

B. Related Sections:
   1. Section 03100 - Concrete Forms and Accessories.
   2. Section 03251 – Expansion and Construction Joints.

1.2 REFERENCES

A. American Concrete Institute:
   1. ACI 301 - Specifications for Structural Concrete.
   2. ACI 305 - Hot Weather Concreting.
   3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
   4. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:
   1. ASTM C33 - Standard Specification for Concrete Aggregates.
   2. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
   3. ASTM C150 - Standard Specification for Portland Cement.
   4. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
   5. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
   6. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
   7. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
   8. ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
   9. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
   10. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
   11. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on joint devices, attachment accessories, admixtures and.

C. Design Data:
1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
a. Hot and cold weather concrete work.
b. Air entrained concrete work.
2. Identify mix ingredients and proportions, including admixtures.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

B. Acquire cement and aggregate from one source for Work.

C. Conform to ACI 305 when concreting during hot weather.

D. Conform to ACI 306.1 when concreting during cold weather.

1.5 COORDINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement: ASTM C150, Type IIA - Air Entraining Portland type; ASTM C595, list appropriate blend and cement type.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: Clean and not detrimental to concrete.

2.2 ADMIXTURES

A. Air Entrainment: ASTM C260.

B. Chemical: ASTM C494 Type A - Water Reducing Type B - Retarding Type C - Accelerating Type D - Water Reducing and Retarding Type E - Water Reducing and Accelerating Type F - Water Reducing, High Range Type G - Water Reducing, High Range and Retarding.

C. Fly Ash: ASTM C618 Class F.

D. Plasticizing: ASTM C1017.

2.3 ACCESSORIES

A. Bonding Agent: Polymer resin emulsion Polyvinyl Acetate Latex emulsion Two component modified epoxy resin Non-solvent two component polysulfide epoxy Mineral filled polysulfide polymer epoxy Mineral filled polysulfide polymer epoxy resin Polyamid cured epoxy.

B. Non-Shrink Grout: ASTM C1107, Grade A; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

C. Concrete Reinforcing Fibers: ASTM C1116, high strength industrial-grade fibers specifically engineered for secondary reinforcement of concrete. Tensile strength -130 ksi; toughness 15 ksi; 3/4 inch long fibers, 34 million/lb fiber count.

2.4 CONCRETE MIX

A. Mix concrete in accordance with ACI 301. Deliver concrete in accordance with ASTM C94.

B. Select proportions for normal weight concrete in accordance with ACI 301 trial mixtures.

C. Provide concrete to the following criteria: Slump 4 inch +- 1 inch; Air entrainment 6% +- 1.5%; 28 day compressive strength 4000 psi.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify requirements for concrete cover over reinforcement.

C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.

B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

3.3 PLACING CONCRETE

A. Place concrete in accordance with ACI 301.

B. Notify Architect/Engineer minimum 24 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, are not disturbed during concrete placement.

D. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

E. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface.

F. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

G. Install joint device anchors. Maintain correct position to allow joint cover to be flush with floor finish.

H. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

I. Place concrete continuously between predetermined expansion, control, and construction joints.

J. Do not interrupt successive placement; do not permit cold joints to occur.

K. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

L. Slope floor to drains where applicable.

3.4 CONCRETE FINISHING

A. Provide formed concrete surfaces to be left exposed with finish as Scheduled in this section.

B. Finish concrete floor surfaces in accordance with ACI 301.

C. Steel trowel surfaces which are indicated to be exposed.

3.5 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure floor surfaces in accordance with ACI 301.

3.6 FIELD QUALITY CONTROL

A. Section 01400 - Quality Requirements: Testing and Inspection Services.

B. Field inspection and testing will be performed in accordance with ACI 301 and under provisions of Section 01400.

C. Provide free access to Work and cooperate with appointed firm.

D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.

E. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

F. Three concrete test cylinders will be taken for every 30 or less cu yds of concrete placed.

G. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.

H. One slump test will be taken for each set of test cylinders taken.

I. One air content test will be made for each set of test cylinders taken.

J. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.7 PATCHING

A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.

C. Patch imperfections in accordance with ACI 301.

3.8 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by Architect/Engineer.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

3.9 SCHEDULE - CONCRETE TYPES AND FINISHES

A. Floor Slabs: 4,000 psi 28 day concrete, air entrained, toweled finish with light broomed surface.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Steel grating

B. Shop fabricated aluminum brackets.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals.

B. Section 01400 - Quality Control.

C. Section 03300 - Cast-in-Place Concrete.

D. Section 09900 - Paints and Coatings.

1.3 REFERENCES

A. ASTM A36 - Structural Steel.

B. ASTM A123 - Zinc (Hot-Galvanized) Coatings on Products Fabricated From Rolled, Pressed and Forged Steel Shapes, Plates, Bars, and Strip.

C. ASTM B221 - Aluminum Alloy Extruded Bars, Rods, Shapes, and Tubes.

D. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.

E. ASTM A386 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.

F. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

G. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

H. AWS A2.0 - Standard Welding Symbols.

I. AWS D1.1 - Structural Welding Code.

J. SSPC - Steel Structures Painting Council.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

1.5 QUALIFICATIONS

A. Welder's Certificates: Submit under provisions of Section 01300, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.6 FIELD MEASUREMENTS

B. Verify that field measurements are as indicated on drawings instructed by the manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel Sections: ASTM A36.

B. Steel Plates: ASTM A36.

C. Bolts, Nuts, and Washers: Stainless steel Type 304.

D. Welding Materials: AWS D1.1; type required for materials being welded.

E. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

F. Aluminum – Plate, ASTM B209-02, ASTM B632 Type 5052

G. Aluminum - Bars, Rods, Shapes, and Tubes, ASTM B221, Type 6061-T60R or 6063-T6.

H. Stainless Steel – Bars, shapes, and tubes, ASTM A276, Type 304, 304L, 316 or 316L.

I. Touch-Up Primer for Galvanized Surfaces: Zinc rich type.

2.2 FABRICATION

A. Fit and ship assemble in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.3 FINISHES

A. Galvanize in accordance with ASTM A123, structural steel members. Provide minimum 1.25 oz/sq ft galvanized coating.

2.4 METAL GRATING

A. General**:** Metal grating shall be of the design, sizes and types shown.

B. Metal Grating: Metal grating shall be of aluminum or stainless steel as shown. No single piece of grating shall weight more than 80 lb. unless otherwise specified or shown.

C. All grating sections and grating penetrations shall be completely banded.

D. Molnar Slip-Not Coating. Aluminum grating shall have a slip-resistant aluminum SLIP-NOT surface, as manufactured by W.S. Molnar Company (W.S Molnar Co.; Detroit, MI; (314) 923-0400) or pre-approved equal. The surfacing material shall consist by volume 90% aluminum and 10% aluminum oxide grit, 8-10 microns uniformly dispersed throughout the volume. The surfacing material shall have a bond strength to the plate (grating) of at leased 2,000 psi.

2.5 ADHESIVE ANCHORS

A. Adhesive Anchors: Unless otherwise shown or specified, all drilled, concrete or masonry anchors shall be adhesive anchors. Accompanied with ICBO report verifying strength and material equivalency.

1. Epoxy adhesive anchors are required for drilled anchors where exposed to weather, in submerged, wet, splash, overhead, and corrosive conditions, and for anchoring handrails, pumps, mechanical equipment, and reinforcing bars. Threaded rod shall be stainless steel Type 316.

2. Unless otherwise shown, glass capsule, polyester resin adhesive anchors

will be permitted in locations not specified above. Threaded rod shall be galvanized steel.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Beginning of installation means erector accepts existing conditions.

3.2 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

3.3 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Obtain Engineers approval to field weld components.

D. Perform field welding in accordance with AWS D1.1.

E. Obtain Engineer approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

G. Install all materials in strict accordance with manufacturer's requirements.

H. Drilled anchors and reinforcing bars shall be installed in strict accordance with the manufacture's instructions. Holes shall be roughened with a brush on a power drill cleaned and dry. Drilled anchors shall not be loaded until the concrete has reached the specified 28-day compressive strength. Adhesive anchors shall not be loaded until the adhesive has reached its specified strength in accordance with the manufacturer's instructions.

I Seal field cut aluminum grating according to manufacturer's instructions.

J. Unsupported ends of abutting panels shall be secured with clips recommended by the manufacturer.

K. Screws into fiberglass tanks shall be pilot drilled to the diameter of the shank of the threaded area.

L. Do not overstress or deflect attaching pieces to allow for connections to work properly.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION

SECTION 06112

FRAMING AND SHEATHING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes wall, and built-up structural beams, wall sheathing; sill gaskets; preservative treatment of wood; miscellaneous framing and sheathing.

1.2 REFERENCES

A. American Wood-Preservers' Association:
   1. AWPA C1 - All Timber Products - Preservative Treatment by Pressure Process.

B. The Redwood Inspection Service:
   1. RIS - Standard Specifications for Grades of California Redwood Lumber.

C. Western Wood Products Association:
   1. WWPA G-5 - Western Lumber Grading Rules.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with the following:
   1. Lumber Grading Agency: Certified by WWPA-G5
   2. Wood Structural Panel Grading Agency: Certified by EWA - The Engineered Wood Association.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Product storage and handling requirements.

PART 2 PRODUCTS

2.1 LUMBER MATERIALS

A. Lumber Grading Rules: WWPA.

B. Beam Framing: DFL species, #2 grade, 19 percent maximum moisture content.

C. Non-structural Light Framing: DFL species, Stud grade, 19 percent maximum moisture content.

D. Studding: DFL species, #2 grade,19 percent maximum moisture content.

2.2 SHEATHING MATERIALS

A. Match existing – 1 X 4, 1 X 2 S/P/F PLANKS: Grade: #1 or Better, Clear of knots.

2.3 ACCESSORIES

A. Fasteners and Anchors:
   1. Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
   2. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete.

B. Structural Framing Connectors: Hot dipped galvanized steel, sized to suit framing conditions, manufactured by Simpson or Equal.

C. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed cell polyethylene foam from continuous rolls.

2.4 FACTORY WOOD TREATMENT

A. Wood Preservative (Pressure Treatment): AWPA Treatment C1 using water borne preservative with 0.25 percent retainage.

PART 3 EXECUTION

3.1 FRAMING

A. Set structural members level and plumb, in correct position.

B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.

C. Place horizontal members, crown side up.

D. Construct load bearing framing members full length without splices.

E. Place sill gasket directly on cementitious foundation. Puncture gasket clean and fit tight to protruding foundation anchor bolts.

3.2 SHEATHING

A. Install at spacing and nailing to match existing. Form Vertical joint at location of splice. And cover with 1 x 2 nailed in place

B. Place all joints over a stud.

3.3 TOLERANCES

A. Section 01400 - Quality Requirements: Tolerances.

B. Framing Members: 1/4 inch from indicated position, maximum.

END OF SECTION

SECTION 07610

ALUMINUM TRIM

PART 1 GENERAL

1.1 SUMMARY:

A. Scope of Work
   1. Furnish and Install Aluminum trim surrounding replacing windows and doors.
   2. Provide all necessary accessories, edge trim, moldings, corners, and attachment clips as required.

1.2 SECTION INCLUDES

A. Aluminum materials and installation

1.3 REFERENCES

A. ASTM B 209 – Standard Specification for Aluminum and Aluminum – Alloy Sheet and Plate.

1.4 PERFORMANCE REQUIREMENTS:

A. Design Requirements:
   1. System shall meet performance criteria per manufacture.

B. Wind Loading: Design and size components to withstand dead and live loads cause by wind pressures as follows:
   1. Positive pressure: 25 psf normal to panel.
   2. Negative pressure: 25 psf normal to panel.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300. Alternates to this specification must be submitted ten (10) days prior to bid date.

B. Product Data: Submit manufacturer’s current product specifications and installation instructions.

C. Samples: Submit two samples of each type of metal panel required, not less than 12 inches, and illustrating finished panel profile, color, sheen,

and texture.

1.6 QUALITY ASSURANCE

A. Installer: Company specializing in the type of work requires for this project, with not less than 2 years of documented experience.

1.7 DELIVERY, STORAGE AND HANDLING

A. Comply with provisions of Section 01600.

B. Do not deliver materials of this section to project site until suitable facilities for storage and protection are available.

C. Protect materials from damage during transit and at project site. Store under cover but sloped to provide positive drainage. Do not expose materials with strippable protective film to direct sunlight or extreme heat.

1.8 WARRANTY

A. Comply with provisions of Section 01700.

B. Submit manufacturer's standard warranty. a twenty (20) year limited warranty against chipping, cracking, peeling, chalking, and fading is required.

PART 2 PRODUCTS

2.1 MATERIALS

A. Aluminum Sheet: ASTM B 209 Prefinish as specified under panel type.

2.2 FINISH

A. Corrosion inhibiting primer and baked on acrylic top coat.

PART 3 EXECUTION

3.1 EXAMINATION

A. Installer shall examine all substrates on which panel system and accessories are to applied.

1. If surfaces are not suitable for application of panel system, installer

shall notify the architect in writing.

2. Installation shall not proceed until surface is acceptable to all parties.

3.2 PREPARATION

A. Confirm all furring and support framing is in place and plumb or level prior to installation.

3.3 INSTALLATION

A. Install metal panels and accessories in strict accordance with manufacturer instructions.

B. Protect surfaces from contact with cementitious materials and other dissimilar metals with bituminous paint or other coatings.

C. Fasten panels to structural support with fasteners provided or approved by panel manufacturer. Install panels plumb, level, and true to line.

D. Fully interlock panels or nest with adjacent panels.

E. Remove protective masking from panels immediately after each panel is installed.

F. Care should be taken during handling of panels to prevent bending, twisting, abrasion, scratching, denting, etc.

G. Workmanship to comply with standards established by the Architectural Sheet Metal Community.

H. Use a single piece of material where installation conditions and material lengths allow.

I. Single hem all exposed edges.

3.4 ADJUSTING AND CLEANING

A. Touch up minor abrasions with matching paint provided by panel manufacturer. Remove and replace panels that cannot be satisfactorily touched up.

A. Leave installed work clean, free from grease, finger marks, and stains. Remove all protective masking from material immediately after installation

of product.

B. Upon completion of installation, remove scraps and debris from project site.

3.5 PROTECTION

A. Provide protection as required to assure that completed work of this section will be without damage or deterioration at date of substantial completion.

B. Safety clothing, equipment and precautions must be utilized according to safety standards.

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes sealants and joint backing, precompressed foam sealers, and accessories.

B. Related Sections:
   1. Section 08800 - Glazing: Glazing sealants and accessories.

1.2 REFERENCES

A. ASTM International:
   1. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
   2. ASTM C1193 - Standard Guide for Use of Joint Sealants.
   3. ASTM D1056 - Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
   4. ASTM D1667 - Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
   5. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Products Data: Submit data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

C. Manufacturer's Installation Instructions: Submit special procedures, surface preparation, and perimeter conditions requiring special attention.

D. Warranty: Include coverage for installed sealants and accessories failing to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, and sealants which do not cure.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Applicator: Company specializing in performing Work of this section with minimum three years documented experience.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Section 01600 - Products Requirements.

B. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

1.6 COORDINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with sections referencing this section.

PART 2 PRODUCTS

2.1 JOINT SEALERS

A. Manufacturers:
1. Dow Corning Corp.
2. GE Silicones
3. Mameco International Inc.
4. Pecora Corp.
5. Sika Corp. Model
6. Substitutions: Section 01600 - Products Requirements Not Permitted.

B. Products Description:
1. High Performance General Purpose Exterior (Nontraffic) Sealant: Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single or multi- component.
   a. Type: Sikaflex-1a manufactured by Sika.
   b. Color: Standard colors matching finished surfaces.
   c. Applications: Use for:
      1) Control, expansion, and soft joints in masonry.
      2) Joints between concrete and other materials.
      3) Joints between metal frames and other materials.
      4) Other exterior non-traffic joints for which no other sealant is indicated.
2. General Purpose Traffic Bearing Sealant: Polyurethane; ASTM C920, Grade P, Class 25, Use T; single or multi- component.
   a. Type: SikaFlex 1C-SL manufactured by Sika.
   b. Color: Standard colors matching finished surfaces.
   c. Applications: Use for exterior and interior pedestrian and vehicular traffic bearing joints.
3. Exterior Foam Expansion Joint Sealer: Precompressed foam sealer; Polyurethane with water-repellent; products recommended by manufacturer for traffic-bearing use.
   a. Color: Black color.

b. Size: As required to provide weathertight seal when installed.
c. Applications: Use for exterior wall expansion joints.

4. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, single component, paintable.
   a. Color: Standard colors matching finished surfaces.
   b. Applications: Use for interior wall and ceiling control joints, joints between door and window frames and wall surfaces, and other interior joints for which no other type of sealant is indicated.:
5. Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade NS, Class 25, Uses M and A; approved by manufacturer for continuous water immersion; single or multi- component.
   a. Type: Sikaflex 1a manufactured by Sika.
   b. Color: Standard colors matching finished surfaces.
   c. Applications: Use for Head box, floor perimeter, saw cut joints and trench drain.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D1056, sponge or expanded rubber; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify substrate surfaces and joint openings are ready to receive work.

C. Verify joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter impairing adhesion of sealant.

B. Clean and prime joints.

C. Perform preparation in accordance with ASTM C1193.

D. Protect elements surrounding Work of this section from damage or disfiguration.

3.3 INSTALLATION

A. Perform installation in accordance with ASTM C1193.

B. Perform acoustical sealant application work in accordance with ASTM C919.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

H. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.

I. Caulk all saw cut concrete control joints.

3.4 CLEANING

A. Section 01700 - Execution Requirements: Final cleaning.

B. Clean adjacent soiled surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01700 - Execution Requirements: Protecting installed construction.

B. Protect sealants until cured.

END OF SECTION

SECTION 08114

STANDARD STEEL DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes non-rated, fire rated, thermally insulated, steel doors and panels.

B. Related Sections:
1. Section 08115 - Standard Steel Frames.
2. Section 08710 - Door Hardware.
3. Section 09900 - Paints and Coatings: Field painting of doors.

1.2 REFERENCES

A. American National Standards Institute:
1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

B. ASTM International:
1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM C1363 - Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

C. Hollow Metal Manufacturers Association:
1. HMMA 810 - Hollow Metal Doors.

D. National Fire Protection Association:
1. NFPA 80 - Standard for Fire Doors, Fire Windows.
2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
3. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

E. Underwriters Laboratories Inc.:
1. UL 10B - Fire Tests of Door Assemblies.
2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
3. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
4. UL 1784 - Air Leakage Tests of Door Assemblies.

F. International Building Code:
1. IBC Standard 715.5 - Fire Tests of Door Assemblies.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing, louvers, and finishes.

C. Product Data: Submit door configurations, location of cut-outs for hardware reinforcement.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ANSI A250.8.

B. Fire Rated Door Construction: Conform to NFPA 252. Fire Rated Door Construction: Conform to IBC Standard 715.3.

C. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.

D. Smoke and Draft Control Doors: Tested in accordance with UL 1784.
1. Air Leakage: Maximum 3.0 cfm/sf of door opening with 0.10 inch water gage pressure differential.

E. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.
1. Indicate temperature rise rating for stair doors.
2. Attach smoke label to smoke and draft control doors.

F. Surface Burning Characteristics:
1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84 NFPA 255 UL 723.

G. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing work of this section with minimum 3 years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Break seal on site to permit ventilation.

1.7 COORDINATION

A. Section 01300 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work with door opening construction, door frame, and door hardware installation.

C. Coordinate installation to accommodate door hardware electric wire connections.

PART 2 PRODUCTS

2.1 STANDARD STEEL DOORS

A. Manufacturers:
1. Amweld Building Products, Inc.
2. Ceco Door Products
3. Kewanee Corp.
4. Pioneer Industries
5. Republic Builders Products
6. Steelcraft
7. Substitutions: Section 01600 - Product Requirements.

B. Product Description:
1. Exterior Doors (Insulated): ANSI A250.8, 1-3/4 inch thick.
a. Level 2 - Heavy Duty, Model 1, full flush design.

2.2 COMPONENTS

A. Face: Steel sheet in accordance with ANSI A250.

B. End Closure: Channel, 0.04 inches thick, flush.

C. Core: Cardboard honeycomb polyurethane polystyrene foam mineral fiberboard steel channel grid vertical steel stiffeners.

D. Thermal Insulated Door: Total insulation R-Value of 5, measured in accordance with ASTM C1363.

2.3 ACCESSORIES

A. Primer: ANSI A250.10 rust inhibitive type.

2.4 FABRICATION

A. Fabricate doors with hardware reinforcement welded in place.

B. Configure exterior doors with edge profile to receive recessed weatherstripping.

2.5 SHOP FINISHING

A. Steel Sheet: Galvanized to ASTM A653/A653M G90.

B. Primer: Baked.

C. Shop Finish: Thermal setting Epoxy of owner determined color.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

A. Install doors in accordance with ANSI A250.8.

B. Install door louvers, plumb and level.

C. Coordinate installation of doors with installation of frames specified in Section 08115 and hardware specified in Section 08710.

D. Touch-up damaged shop finishes.

3.3 ERECTION TOLERANCES

A. Section 01400 - Quality Requirements: Tolerances.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.4 ADJUSTING

A. Section 01700 - Execution Requirements: Requirements for adjusting.

B. Adjust door for smooth and balanced door movement.

3.5 SCHEDULE

A. See plans for size.

END OF SECTION

SECTION 08115

STANDARD STEEL FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes fire rated non-rated thermally insulated steel frames.
   1. Provide frames for interior exterior glazed lights.

B. Related Sections:
   1. Section 03300 - Cast-In-Place Concrete: Placement of anchors into masonry wall construction.
   2. Section 08114 - Standard Steel Doors.
   3. Section 08710 - Door Hardware: Hardware, silencers, and weather stripping.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

B. ASTM International:
   1. ASTM A591/A591M - Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.
   2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.

C. Product Data: Submit frame configuration and finishes.

D. Manufacturer's Installation Instructions: Submit special installation instructions.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Conform to requirements of ANSI A250.8.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Product storage and handling requirements.

B. Accept frames on site in manufacturer's packaging. Inspect for damage.

C. Break seal on-site to permit ventilation.

1.7 COORDINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with frame opening construction, door, and hardware installation.

C. Sequence installation to accommodate required door hardware electric wire connections.

PART 2 PRODUCTS

2.1 STANDARD STEEL FRAMES

A. Manufacturers:
1. Amweld Building Products, Inc.
2. Ceco Door Products
3. Dunbarton Corp.
4. Kewanee Corp.
5. Republic Builders Products
6. Steelcraft Model
7. Substitutions: Section 01600 - Product Requirements.

B. Product Description: Standard shop fabricated steel frames, fire rated and non-rated types.
1. Frames: To suit ANSI A250.8 Grade and Model of door specified in Section 08114.

2.2 ACCESSORIES

A. Removable Stops: Rolled steel channel shape, butted corners; prepared for countersink style screws.

B. Bituminous Coating: Non-asbestos fibered asphalt emulsion.

C. Primer: ANSI A250.10 rust inhibitive type.

D. Silencers: Specified in Section 08710.

E. Weatherstripping: Specified in Section 08710.

2.3 FABRICATION

A. Mullions for Double Doors: None.

B. Fabricate frames with hardware reinforcement plates welded in place.

C. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.

D. Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.

E. Configure exterior frames with special profile to receive recessed weatherstripping.

2.4 SHOP FINISHING

A. Steel Sheet: Galvanized to ASTM A653/A653M G90.

B. Primer: Baked.

C. Factory Finish: Baked enamel of owner specified color from manufacture’s standard color palette.

D. Coat inside of frame profile with bituminous coating to minimum thickness of 1/16 inch.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

A. Install frames in accordance with ANSI A250.8.

B. Coordinate installation of frames with installation of hardware specified in Section 08710 and doors in Section 08114.

C. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.3 ERECTION TOLERANCES

A. Section 01400 - Quality Requirements: Tolerances.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

END OF SECTION

SECTION 08500

VINYL WINDOWS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. The work included in this section consists of furnishing and installing single slide vinyl windows, frames and screens for windows as shown on the Drawings and as specified herein.

1.2 SUBMITTALS

A. Submittals shall conform to the provisions of Section 01300 of these Specifications. Data in the form of drawings, catalog cuts, etc. shall be submitted showing dimensions and design features of windows.

PART 2 PRODUCTS

2.1 MATERIALS

A. Frame. Polyvinyl chloride (PVC) compound.

B. Internal Members. PVC compound.

C. Fasteners and Component Parts. PVC, stainless steel or other non-corrosive material.

2.2 VINYL WINDOW FRAMES

A. Frames and sash corners shall be mitered and machine welded. Meeting rails shall interlock and be weather tight. Frame shall weep all moisture to the outside.

2.3 GLAZING

A. Glazing shall meet the requirements of Section 08800 of these Specifications.

B. Glazing tape shall be used to provide a weather tight seal.

C. Glazing bead shall be PVC to match frame color.

2.4 HARDWARE

A. Rolling panels shall glide on tandem nylon rollers contained within a nylon carrier.

B. Locks – Manufacturer’s standard.

C. All frames shall be equipped with an anti-lift feature and secondary lock that permits ventilation while window remains secure.

D. All rolling panels shall be fully weatherstripped on the perimeter edge with silicone-treated, high-pile weatherstripping.

2.5 FINISH

A. Finish color shall be determined by owner from manufacturers standard color schedule.

2.6 SCREENS

A. Screens shall be removable from the inside and out and shall consist of fiberglass screen cloth framed with roll formed aluminum.

B. Screens shall be provided on all exterior windows.

PART 3 EXECUTION

3.1 PREPARATION

A. Remove existing windows and dispose.

B. Prepare surface for installation of replacement window.

C. Confirm attachment type is appropriate with the manufacturers' recommendations.

3.2 INSTALLATION

A. Install vinyl window frames in accordance with Drawings in a rigid substantial manner, square, plumb and level, utilizing approved installation devices.

B. Trim windows in office area per construction drawings and approved submittals.

3.3 CAULKING

A. At junction between frames and adjacent materials, the entire perimeter of the frame shall be sealed on both sides, using materials and methods specified in Section 07900 of the Specifications.

3.4 FINAL CLEANING

A. Final cleaning of vinyl surfaces shall be done in strict accordance with the manufacturer's instructions. No abrasives shall be used.

3.5 SCHEDULE

A. Size: see construction drawings.

B. Type: Single Slide.

END OF SECTION

SECTION 08710

DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes hardware for steel doors.
   1. Provide door gaskets, including weatherstripping and seals, and thresholds.

B. Related Sections:
   1. Section 08114 - Standard Steel Doors.
   2. Section 08115 - Standard Steel Frames: Silencers integral with steel frames.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI A156.1 - Butts and Hinges.
   2. ANSI A156.2 - Bored and Preassembled Locks and Latches.
   3. ANSI A156.3 - Exit Devices.
   4. ANSI A156.4 - Door Controls - Closures.
   5. ANSI A156.5 - Auxiliary Locks and Associated Products.
   6. ANSI A156.6 - Architectural Door Trim.
   7. ANSI A156.7 - Template Hinge Dimensions.
   8. ANSI A156.8 - Door Controls - Overhead Holders.
   9. ANSI A156.13 - Mortise Locks and Latches.
   10. ANSI A156.15 - Closer Holder Release Devices.
   11. ANSI A156.16 - Auxiliary Hardware.
   12. ANSI A156.18 - Materials and Finishes
   13. ANSI A156 - Complete Set of 24 BHMA Standards (A156 Series) with Binder.

B. Builders Hardware Manufacturers Association:
   1. BHMA Directory of Certified Products.

C. Intertek Testing Services (Warnock Hersey Listed):
   1. WH - Certification Listings.

1.3 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Shop Drawings:
   1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts.

2. Submit manufacturer's parts lists.

C. Samples:
1. Submit one sample of typical hinge, latchset, lockset, and closer, illustrating style, color, and finish.
2. Approved samples may be incorporated into Work.

D. Manufacturer's Installation Instructions: Submit special procedures, and perimeter conditions requiring special attention.

1.4 CLOSEOUT SUBMITTALS

A. Section 01700 - Execution Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of installed cylinders and their master key code.

C. Operation and Maintenance Data: Submit data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

D. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with the following requirements:
1. ANSI A156 series.
2. UL 305.

B. Furnish hardware marked and listed in BHMA Directory of Certified Products.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Hardware Supplier: Company specializing in supplying commercial door hardware with minimum three years experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Product storage and handling requirements.

B. Package hardware items individually with necessary fasteners, instructions, and installation templates, when necessary; label and identify each package with door opening code to match hardware schedule.

1.8 COORDINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
   1. Provide templates or actual hardware as required to ensure proper preparation of doors and frames.

C. Sequence installation to accommodate required utility connections.

D. Coordinate Owner's keying requirements during course of Work.

1.9 WARRANTY

A. Section 01700 - Execution Requirements: Product warranties and product bonds.

B. Furnish two year manufacturer warranty for locksets and door closers.

1.10 MAINTENANCE MATERIALS

A. Section 01700 - Execution Requirements: Maintenance materials.

B. Furnish special wrenches and tools applicable for each different and for each special hardware component.

C. Furnish maintenance tools and accessories supplied by hardware component manufacturer.

1.11 EXTRA MATERIALS

A. Section 01700 - Execution Requirements: Spare parts and maintenance products.

B. Furnish one extra key lock cylinders for each master keyed group.

PART 2 PRODUCTS

2.1 DOOR HARDWARE

A. Manufacturers:
   1. Accurate Metal Weather Strip Co. Inc.
   2. American Device Manufacturing Co.
   3. Arrow Architectural Hardware
   4. Bommer Industries, Inc.
   5. Clipenglyde, Inc.
   6. Dorma Door Controls, Inc.

7. NT Falcon Lock
8. Glynn-Johnson
9. Hager Companies
10. Holmes-Hally Industries, Inc.
11. LCN Closers
12. Markar Products, Inc.
13. NT Monarch Hardware
14. Precision Hardware Mfg Co Inc.
15. Reese Industries
16. Sash Controls Inc.
17. Schlage Lock Co.
18. Stanley Hardware
19. Von Duprin, Inc.
20. Substitutions: Section 01600 - Product Requirements

B. Hinge Manufacturers:
1. Bommer Industries, Inc.
2. Hager Companies
3. Stanley Hardware
4. Substitutions: Section 01600 - Product Requirements

C. Lockset, Latch Set, and Cylinder Manufacturers:
1. Schlage
2. Weiser
3. Substitutions: Section 01600 - Product Requirements

D. Closers Manufacturers:
1. Arrow Architectural Hardware
2. Dorma Door Controls, Inc
3. LCN Closers
4. Yale
5. Substitutions: Section 01600 - Product Requirements.

E. Push/Pulls Manual Bolts, Thresholds, and Trim Manufacturers:
1. Schlage Lock Co
2. Reese Industries
3. Pemko
4. Substitutions: Section 01600 - Product Requirements. Thresholds; Not Permitted, manual bolts.

2.2 COMPONENTS

A. General Hardware Requirements: Where not specifically indicated, comply with applicable ANSI A156 standard for type of hardware required. Furnish each type of hardware with accessories as required for applications indicated and for complete, finished, operational doors.
1. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.

2. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by hardware supplier or hardware manufacturer.
3. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.
    a. Finish: Match hardware item being fastened.
4. Fire Ratings: Provide hardware with UL or Intertek Testing Services (Warnock Hersey Listed) listings for type of application involved.

B. Hinges: ANSI A156.1, full mortise type, template type, ANSI A156.7, complying with following general requirements unless otherwise scheduled.
1. Widths: Sufficient to clear trim projection when door swings 180 degrees.
2. Number: Furnish minimum three hinges to 90 inches high, four hinges to 120 inches high for each door leaf.
3. Size and Weight: 4-1/2 inch heavy weight typical for 1-3/4 inch doors.
    a. Doors Over 40 inches Wide: Extra heavy weight ball or oilite bearing hinges.
    b. Doors 1-3/8 inch Thick: 3-1/2 inch size.
    c. Doors 2 inch Thick: 5 inch extra heavy weight ball or oilite bearing.
    d. Doors Over 48 inches Wide: 5 inch extra heavy weight ball or oilite bearing.
4. Pins: Furnish nonferrous hinges with non-removable pins (NRP) at exterior and locked outswinging doors, non-rising pins at interior doors.
5. Tips: Flat button tips with matching plug Flush tips.

C. Pivots: ANSI A156.1, center pivots.
1. Size: As recommended by pivot manufacturer for size and weight of door.

D. Locksets: Furnish locksets compatible with specified cylinders. Typical 2-3/4 inch backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt.
1. Mortise Locksets: ANSI A156.13, Series 1000, Grade 1 unless otherwise indicated.
2. Bored (Cylindrical) Locksets: ANSI A156.2, Series 4000, Grade 1 unless otherwise indicated.
3. Preassembled (Unit) Locksets: ANSI A156.12, Series 2000, Grade 1 unless otherwise indicated.
4. Interconnected Locksets: ANSI A156.12, Series 5000, Grade 1 unless otherwise indicated.
5. Auxiliary Locksets: ANSI A156.5, Grade 1, mortise dead locks unless otherwise indicated.

E. Latch Sets: Match locksets. Typical 2-3/4 inch backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt.
1. Mortise Latch Sets: ANSI A156.13, Series 1000, Grade 1 unless otherwise indicated.
2. Bored (Cylindrical) Latch Sets: ANSI A156.2, Series 4000, Grade 1 unless otherwise indicated.

F. Cylinders: ANSI A156.5, Grade 1, 6 pin type interchangeable core type cylinders.

1. Keying: Key to existing keying system (specified by owner).
2. Include construction keying.
3. Keys: Nickel silver. Stamp keys with “DO NOT DUPLICATE”.
4. Supply keys in the following minimum quantities:
    a. 5 master keys.
    b. 5 construction keys.

G. Closers: ANSI A156.4 modern type with cover, surface mounted closers; full rack and pinion type with steel spring and non-freezing hydraulic fluid; closers required for fire rated doors unless otherwise indicated.
1. Adjustability: Furnish controls for regulating closing, latching, speeds, and back checking.
2. Arms: Type to suit individual condition; parallel-arm closers at reverse bevel doors and where doors swing full 180 degrees.
3. Location: Mount closers on inside of exterior doors, room side of interior doors typical; mount on pull side of other doors.
4. Operating Pressure: Maximum operating pressure as follows.
    a. Interior Doors: Maximum 5 pounds.
    b. Exterior Doors: Maximum 10 pound.
    c. Fire Rated Doors: As required for fire rating, maximum 15 pounds.

H. Door Controls and Overhead Holders: Furnish with accessories as required for complete operational installation.
1. Manual Door Holders: ANSI A156.8, Grade 1 types as specified

I. Manual Bolts, Protection Plates, Gaskets, Thresholds, and Trim: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.
1. Manual Constant Latching Bolts: ANSI A156.16 Grade 1 top and bottom flush bolts, with dust-proof floor strike, unless otherwise indicated.
2. Kickplates Armor Plate: ANSI A156.6, metal; height indicated in Schedule by 1 inch less than door width; minimum 0.050 inch thick stainless steel.
3. Weatherstripping: Furnish continuous weatherstripping at top and sides of exterior doors.
4. Fire Rated Gaskets: Furnish continuous fire rated gaskets at top and sides of fire rated doors.
5. Thresholds: Maximum 1/2 inch height.
6. Silencers: rubber type, ¼” diameter attachéd to hole in frame.
7. Wall Stops: ANSI A156.1, Grade 1, 3 inch wall stop convex pad wall stop with no visible screws.

2.3 ACCESSORIES

A. Lock Trim: Furnish levers with rose as selected from manufacturer’s full range of levers and roses.

B. Through Bolts: Do not permit through bolts and grommet nuts on door faces in occupied areas unless no alternative is possible.

2.4 FINISHING

A. Finishes: ANSI A156.18; furnish following finishes except where otherwise indicated in Schedule at end of section.
   1. Hinges:
      a. BHMA 630 and 626, satin finish.
   2. Typical Exterior Exposed and High Use Interior Door Hardware:
      a. BHMA 630, satin finished stainless steel.
   3. Typical Interior Door Hardware:
      a. BHMA 630, satin finished stainless steel.
   4. Typical Interior Bathroom Door Hardware:
      a. BHMA 630, satin finished stainless steel.
   5. Closers: Finish appearance to match door hardware on same face of door.
      a. BHMA 628, satin aluminum, clear anodized.
   6. Thresholds: Finish appearance to match door hardware on exterior face of door.
      a. BHMA 630, satin finished stainless steel.
   7. Other Items: Furnish manufacturer's standard finishes to match similar hardware types on same door, and maintain acceptable finish considering anticipated use and BHMA category of finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify new cylinders will match existing locks on building.

C. Verify doors and frames are ready to receive door hardware and dimensions are as indicated on shop drawings.

3.2 INSTALLATION

A. Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.

B. Mounting Heights From Finished Floor to Center Line of Hardware Item: Comply with manufacturer recommendations and applicable codes where not otherwise indicated.
   1. Locksets: 38 inch.
   2. Push/Pulls: 42 inch.
   3. Dead Locks: 48 inch.
   4. Push Pad Type Exit Devices: 42 inch.
   5. Cross Bar Type Exit Devices: 38 inch.

6. Top Hinge: Jamb manufacturer's standard, but not greater than 10 inches from head of frame to center line of hinge.
7. Bottom Hinge: Jamb manufacturer's standard, but not greater than 12-1/2 inches from floor to center line of hinge.
8. Intermediate Hinges: Equally spaced between top and bottom hinges and from each other.
9. Hinge Mortise on Door Leaf: 1/4 inch. to 5/16 inch from stop side of door.

3.3 FIELD QUALITY CONTROL

A. Section 01400 - Quality Requirements: Testing and Inspection Services 01700 - Execution Requirements: Testing, adjusting, and balancing.

3.4 ADJUSTING

A. Section 01700 - Execution Requirements: Testing, adjusting, and balancing.

B. Adjust hardware for smooth operation.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01700 - Execution Requirements: Protecting installed construction.

B. Do not permit adjacent work to damage hardware or hardware finish.

3.6 SCHEDULES

A. The following hardware sets are intended to establish type and standard of quality when used together with this section requirements. Examine Drawings and Specifications and furnish proper hardware for door openings.

Hardware Set 1: - South Door

Hinges:	Full mortise hinges as specified.
Closer:	Surface mounted as specified.
Latch Set:	Classroom Function
Kickplates:	16 inch high, exterior.
Threshold:	Aluminum as specified.
Weatherstripping:	As specified.
Door Stop:	Floor stop.
Door Holders	Floor Holders
Silencers:	Frame mounted as specified.

Hardware Set 2: - North Door

Hinges:	Full mortise hinges as specified.
Closer:	Surface mounted as specified.
Latch Set:	Classroom Function

Kickplates:	16 inch high exterior.
Threshold:	Aluminum as specified.
Weatherstripping:	As specified.
Door Stop:	Floor stop.
Door Holders:	Floor Holder.
Silencers:	Frame mounted as specified.
Flushbolts:	Manual

Hardware Set 3: - West Door

Hinges:	Full mortise hinges as specified.
Pull:	Interior, as specified above.
Silencers:	Frame mounted as specified.
Deadbolt:	Inside actuation only. No key.

END OF SECTION

SECTION 08800

GLAZING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes glass glazing for metal frames, doors, windows.
   1. Glass glazing materials and installation requirements are included in this section for other sections referencing this section.

B. Related Sections:
   1. Section 07900 - Joint Sealers: Sealant and back-up material other than glazing sealants.
   2. Section 08500 – Vinyl Windows: Glazed windows.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI Z97.1 - Safety Glazing Materials Used in Buildings Safety.

B. American Society of Civil Engineers:
   1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International:
   1. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
   2. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
   3. ASTM C1036 - Standard Specification for Flat Glass.
   4. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass.
   5. ASTM C1193 - Standard Guide for Use of Joint Sealants.
   6. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
   7. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
   8. ASTM E546 - Standard Test Method for Frost Point of Sealed Insulating Glass Units.
   9. ASTM E576 - Standard Test Method for Frost Point of Sealed Insulating Glass Units in the Vertical Position.
   10. ASTM E773 - Standard Test Methods for Seal Durability of Sealed Insulating Glass Units.
   11. ASTM E774 - Standard Specification for Sealed Insulating Glass Units.
   12. ASTM E1425 - Standard Practice for Determining the Acoustical Performance of Exterior Windows and Doors.

D. Glass Association of North America:
   1. GANA - FGMA Sealant Manual.
   2. GANA - Glazing Manual.
   3. GANA - Laminated Glass Design Guide.

E. Underwriters Laboratories Inc.:
   1. UL - Building Materials Directory.

1.3 PERFORMANCE REQUIREMENTS

A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
   1. To utilize inner pane of multiple pane sealed units for continuity of air barrier and vapor retarder seal.
   2. To maintain continuous air barrier and vapor retarder throughout glazed assembly from glass pane to heel bead of glazing sealant.

B. Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with ASCE 7 - Calculation of Wind Loads.

C. Limit glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.

1.4 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Product Data:
   1. Glass: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
   2. Glazing Sealants, Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors where exposed.

C. Certificates: Certify products meet or exceed specified requirements.

D. Manufacturer's Certificate: Certify sealed insulated environmental glass, meets or exceeds specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual, GANA Sealant Manual, GANA Laminated Glass Design Guide for glazing installation methods.

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 01600 - Product Requirements.

B. Do not install glazing when ambient temperature is less than 50 degrees F.

C. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.8 WARRANTY

A. Section 01700 - Execution Requirements: Product warranties and product bonds.

B. Furnish five year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

C. Furnish five year warranty to include coverage for delamination of laminated glass and replacement of same.

1.9 EXTRA MATERIALS

A. Section 01700 - Execution Requirements: Spare parts and maintenance products.

PART 2 PRODUCTS

2.1 GLAZING

A. Manufacturers:
1. Arch Aluminum & Glass LC
2. Atohass Americas Inc.
3. Flex-Lite Corp.
4. Glass Unlimited Inc / Ambiance
5. Graham FRP Composites
6. Inkan Ltd.
7. Libbey-Owens-Ford, Inc.
8. Viracon
9. Substitutions: Section 01600 - Product Requirements.

2.2 COMPONENTS

A. Flat Glass (Type FG): Minimum 1/8 inch unless otherwise indicated.
1. Clear Float Glass (Type FG-CF): ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select.
2. Clear Heat Strengthened Glass (Type FG-CH): ASTM C1048, Kind HS, heat strengthened, Condition A uncoated, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select.
a. Visible Light Transmittance: 91 percent.

b. Shading Coefficient: 1.04.
c. Solar Heat Gain Coefficient: 0.90.

3. Low E Clear Float Glass (Type FG-EC): Clear float glass Type FG-CF, with low emissivity coating on inner surface.
   a. Visible Light Transmittance: 91 percent.
   b. Shading Coefficient: 0.59.
4. Low E Clear Heat Strengthened Glass (Type FG-EHC): Clear heat strengthened glass Type FG-CH, with low emissivity coating on inner surface.
   a. Visible Light Transmittance: 91 percent.
   b. Shading Coefficient: 0.59. Safety Glass (Type SG): Conform to ANSI Z97.1, minimum thickness 1/4 inch unless otherwise indicated.

B. Safety Glass (Type SG) Conform to ANSI Z97.1, Total thickness ¼ inch unless otherwise indicated.
   1. Clear Tempered Glass (Type SG-CT): ASTM C1048, Kind FT Fully tempered, Condition A, uncoated, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select; with horizontal tempering.

C. Insulated Glass Units (Type IG): Total unit thickness 3/4 inch.
   1. Double Pane Insulated Glass Units (Type IG-DP): ASTM E774 Class A and E773; with glass elastomer edge seal; place reflective film within unit; purge interpane space with dry air.
      a. Outer Pane: Glass Type: FG-EC.
      b. Inner Pane: FG-CF.
      c. Solar Heat Gain Coefficient: 0.58
      d. U Factor: 0.38 Maximum
   2. Insulated Glass Unit Edge Seal Construction: Aluminum, bent and soldered corners.

2.3 ACCESSORIES

A. Elastomeric Glazing Sealants: Materials compatible with adjacent materials including glass, laminated glass core, insulating glass seals, and glazing channels.
   1. Silicone Glazing Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component; chemical curing; capable of water immersion without loss of properties; non-bleeding, cured Shore A hardness of 15 to 25.
      a. Color: As selected.
      b. Structural Silicone: Furnish high-modulus structural silicone glazing materials where sealant bonds glass to substrate.
   2. Polysulfide Glazing Sealant: ASTM C920, Type M, Grade NS, Class and Use suitable for glazing application indicated; two component; chemical curing, non-sagging type; cured Shore A hardness of 15 to 25.
      a. Color: As selected.
   3. Polyurethane Glazing Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component,

chemical curing, non-staining, non-bleeding, Shore A Hardness Range 20 to 35.
a. Color: As selected.

4. Acrylic Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component, solvent curing, non-bleeding; cured Shore A hardness of 15 to 25.
a. Color: as selected.

B. Glazing Gaskets: ASTM C864 Option I, resilient neoprene silicone polyvinyl chloride extruded shape to suit glazing channel retaining slot.
1. Color: Black.

C. Pre-Formed Glazing Tape: Size to suit application.
1. Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.
a. Butyl Corner Sealant: ASTM C920 single component non-skinning butyl compatible with glazing tape; color to match tape.

D. Setting Blocks: ASTM C864 Option I, Neoprene, 80 to 90 Shore A durometer hardness, length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

E. Spacer Shims: ASTM C864 Option I, Neoprene, 50 to 60 Shore A durometer hardness, minimum 3 inch long x one half the height of glazing stop x thickness to suit application.

F. Glazing Clips: Manufacturer's standard type.

G. Fire-Resistant Glazing Materials: Materials used to obtain required fire-resistant rating.

H. Smoke Removal Unit Targets: Adhesive targets affixed to glass to identify glass units destined for removal for smoke control.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify openings for glazing are correctly sized and within acceptable tolerance.

C. Verify surfaces of glazing channels or recesses are clean, free of obstructions impeding moisture movement; weeps are clear, and ready to receive glazing.

3.2 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION

A. Perform installation in accordance with GANA Glazing Manual.
   1. Glazing Sealants: Comply with ASTM C1193.
   2. Fire Rated Openings: Comply with NFPA 80.

B. Exterior Dry Method (Tape and Gasket Spline Glazing):
   1. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with compatible butyl sealant.
   2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
   3. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
   4. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
   5. Trim protruding tape edge.

C. Exterior Wet/Dry Method (Preformed Tape and Sealant) Installation:
   1. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with compatible butyl sealant.
   2. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapor seal.
   3. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
   4. Rest glazing on setting blocks and push against tape with sufficient pressure to attain full contact at perimeter of pane or glass unit.
   5. Install removable stops, with spacer strips inserted between glazing and applied stops, 1/4 inch below sight line. Place glazing tape on glazing pane or unit with tape flush with 1/4 inch below sight line.
   6. Fill gap between glazing and stop with elastomeric glazing sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.
   7. Apply cap bead of elastomeric glazing sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

D. Exterior Wet Method (Sealant and Sealant) Installation:
   1. Place setting blocks at 1/4 points and install glazing pane or unit.

2. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inches intervals, 1/4 inch below sight line.
3. Fill gaps between glazing and stops with elastomeric glazing sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.
4. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

E. Exterior and Interior Butt Glazed Method (Sealant Only) Installation:
1. Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
2. Temporarily secure small diameter non-adhering foamed rod on back side of joint.
3. Apply sealant to open side of joint in continuous operation; thoroughly fill joint without displacing foam rod. Tool sealant surface smooth to concave profile.
4. Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.
5. Remove masking tape.

F. Interior Dry Method (Tape and Tape) Installation:
1. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
3. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
4. Place glazing tape on free perimeter of glazing in same manner described above.
5. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
6. Knife trim protruding tape.

G. Interior Wet/Dry Method (Tape and Sealant) Installation:
1. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.
2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
3. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
4. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.
5. Fill gaps between pane and applied stop with elastomeric glazing sealant to depth equal to bite on glazing, to uniform and level line.
6. Trim protruding tape edge.

H. Interior Wet Method (Compound and Compound) Installation:

1. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.
2. Locate and secure glazing pane using spring wire clips.
3. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

I. Plastic Film Installation:
1. Install plastic film with adhesive.
2. Place without air bubbles, creases or visible distortion.
3. Fit tight to glass perimeter with razor cut edge.

3.4 FIELD QUALITY CONTROL

A. Section 01400 - Quality Requirements: Testing and Inspection Services 01700 - Execution Requirements: Testing, adjusting, and balancing.

B. Monitor quality of glazing.

3.5 MANUFACTURER'S FIELD SERVICES

A. Section 01400 - Quality Requirements: Manufacturers’ field services.

B. Glass product manufacturers to provide field surveillance of installation.

C. Monitor and report installation procedures, and unacceptable conditions.

3.6 CLEANING

A. Section 01700 - Execution Requirements: Final cleaning.

B. Remove glazing materials from finish surfaces.

C. Remove labels after Work is complete.

D. Clean glass and adjacent surfaces.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01700 - Execution Requirements: Protecting installed construction.

B. After installation, mark pane with an 'X' by using removable plastic tape or paste.

3.8 SCHEDULE

A. Exterior Windows – Hatchery: IG

END OF SECTION

SECTION 09900

PAINTING AND COATING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation and field application of paints and coatings.

1.2 RELATED SECTIONS

A. Section 01300 – Submittals.

B. Section 01400 – Quality Control.

C. Section 01700 – Contract Closeout.

D. Section 03300 – Cast-in-Place Concrete.

E. Section 05500 – Metal Fabrications: Shop primed / galvanized items.

F. Section 08100 – Steel Doors and Frames.

1.3 REFERENCES

A. ASTM D-16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

B. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications.

C. PDCA (Painting and Decorating Contractors of America) Painting - Architectural Specifications Manual.

D. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual

1.4 DEFINITIONS

A. Conform to ASTM D-16 for interpretation of terms used in this Section.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide data on all finishing products.

C. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

1.6 CLOSEOUT SUBMITTALS

A. Section 01700 - Execution Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01600 - Product Requirements: Product storage and handling requirements.

B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

C. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

D. Store paint materials at minimum ambient temperature of 45°F (7°C) and a maximum of 90°F (32°C), in ventilated area, and as required by manufacturer's instructions.

E. Take all necessary precautionary measures to prevent fire hazards and spontaneous combustion. Open containers of materials only as needed for use; keep closed when not in use. Keep oily/finish material and soaked rags in tightly closed containers. Dispose of used rags off the site daily; remove empty containers from the site daily.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

C. Minimum Application Temperatures for Latex Paints: 45°F (7°C) for interiors; 50°F (10°C) for exterior; unless required otherwise by manufacturer's instructions.

D. Minimum Application Temperature for Alkyd Finishes: 65 degrees F (18 degrees C) for interior or exterior, unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candle measured mid-height at substrate surface.

1.10 REGULATORY REQUIREMENTS

B. Conform to applicable code for flame and smoke rating requirements for finish.

C. Section 01700 - Execution Requirements: Spare parts and maintenance products.

1.11 EXTRA MATERIALS

A. Supply 1 gallon of each color and type; store where directed.

B. Label each container with color, type, texture, and room locations, in addition to manufacturer's label.

C. Supply the Owner with one copy of the color schedule.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers - Paint

1. Columbia Paint
2. Carboline
3. Dupont
4. Tnemec
5. Ameron
6. Sherwin Williams

B. Paint and coating materials shall be highest quality material Trade names used herein refer to materials manufactured and are used to establish a basis of quality for bidding. The Engineer or Architect is not bound to approve all types of paint from any one manufacturer. Material for each general purpose shall be of the same manufacturer and materials of different manufacturer shall not be used over one another, except for shop prime coats applied under Sections of the Project Manual.

C. Special systems as specified for surface conditions by the manufacturer specified; substitution only upon affidavit of alternate manufacturer that product will meet conditions and label for surface use.

2.2 MATERIALS

A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, and of commercial quality.

B. Patching Materials: Latex filler.

C. Fastener Head Cover Materials: Latex filler.

2.3 COLORS

A. Paint colors shall be approved by the owner submit color patches.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application. The Painting Contractor shall be responsible for examination and acceptance of all surfaces and conditions affecting proper application of the materials, and shall not proceed until unsatisfactory conditions have been corrected; the application of the first coat a finish system to any surface shall constitute acceptance of that surface.

D. Test shop applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
2. Interior Wood: 15 percent, measured in accordance with ASTM D-2016.
3. Exterior Wood: 15 percent, measured in accordance with ASTM D-2016.

3.2 PREPARATION

A. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

B. Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.

C. Seal with shellac and seal marks which may bleed through surface finishes.

D. Interior Wood Items Scheduled to Receive Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.

E. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

F. Wood: Remove grade marks; seal knots with suitable sealer. Hand sand woodwork and trim; dust clean. All nail holes to be filled with suitable interior or exterior grade filler compound.

G. Concrete and Unit Masonry Surfaces Scheduled to Receive Stain or Paint Finish:

Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry. Repair surfaces in concrete and masonry in accordance with Section 03300 and 04100, respectively.

H. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

I. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

J. Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

K. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

3.3 APPLICATION

A. Apply paint to new surfaces and trim connecting new and old surfaces. Do not paint existing surfaces.

B. Apply products in accordance with manufacturer's instructions.

C. Do not apply finishes to surfaces that are not dry.

D. Apply each coat to uniform finish. Each coat of paint or finish shall be applied at proper consistency according to the manufacturer’s directions; brushed evenly, and free of brush marks, sags, and runs, with no evidence of poor workmanship. Care shall be exercised to avoid lapping; paint to be sharply cut to lines. Finished surfaces shall be free from defects or blemishes.

E. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

F. Sand metal lightly between coats to achieve required finish.

G. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.

H. Allow applied coat to dry before next coat is applied.

3.4 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

3.5 CLEANING

A. Section 01700 – Contract Closeout: Final Cleaning.

B. Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.6 SCHEDULE - EXTERIOR SURFACES

A. Steel/Miscellaneous Metals - Shop Primed:
1. Touch-up with compatible primer.
2. Two coats of polyurethane enamel, gloss.

B. Steel/Miscellaneous Metals – Unprimed:
1. One coat of primer/neutralizer.
2. Two coats of alkyd gloss enamel.

C. Steel - Galvanized:
1. One coat galvanize primer.
2. Two coats of alkyd gloss enamel.

3.7 SCHEDULE - INTERIOR SURFACES

A. Steel/Miscellaneous Metals – Unprimed:
1. One coat of alkyd primer.
2. Two coats of polyurethane enamel, gloss.

B. Steel/Miscellaneous Metals – Primed:
1. Touch-up with alkyd primer. No. 04-022PP
2. Two coats of polyurethane enamel, gloss.

C. Steel - Galvanized:
1. One coat galvanize primer.
2. Two coats of alkyd enamel, gloss.

D. Steel/Miscellaneous Metals – Unprimed:
1. One coat of primer/neutralizer.
2. Two coats of alkyd gloss enamel.

F. Metal Doors and Frames:
1. Touch up abraded prime coat.
2. Two coats of alkyd semi-gloss enamel.

G. Wood - Painted:
One coat of latex prime sealer.
One coat of latex enamel, semi-gloss.

3.8 COLORS

A. Colors shall be as selected from manufacturer's standard. Colors will be selected by Owner.

3.9 CLEANING AND REPAIRING

A. Painter responsible for all defective work no matter what the cause, including unsuitable and improperly prepared surfaces; refinish at Painter’s expense. Painted surfaces shall be free from defects in workmanship or materials. Repair work damaged during construction before time of final project acceptance; touch-up or refinish as necessary abraded, stained or otherwise disfigured surfaces.

3.10 CLEAN UP

A. During painting, clean up, remove from project, containers and cartoons, rubbish, and rags resulting from work of this section. Maintain premises in clean, orderly condition at all times. Upon completion remove rubbish, tools, equipment, unused products from project.

END OF SECTION

FRP FISH REARING TANKS

SECTION 13209

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Fiberglass reinforced plastic tanks for aquaculture rearing purposes. Also screens for separation of fish, outlets and standpipes for maintaining water level in the pipe and to assist cleaning

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ANSI/NFPA 70
B. ASTM D 638 Test Method for Tensile Properties of..Plastics
C. ASTM D 695 Test Method for Compressive Properties of Rigid Plastics
D. ASTM D 790 Test Methods for Flexural Properties of Lin reinforced and Reinforced Plastics and Electrical Insulating Materials
E. ASTM D 883 Definitions of Terms Relating to Plastics
F. ASTM D 2563 Recommended . Practice for Classifying . Visual Defects in Glass-Reinforced Plastic Laminate Parts
G. ASTM D 2583 Test 'Method for Indentation Hardness of Rigid Plastics by Means of a. Barcol impresser.
H. ASTM D 2584 Test Method for Ignition Loss of Cured Reinforced Resins
I. ASTM D 4097 Standard Specification for Contact-Molded GlassFiber-Reinforced Thermoset Resin Chemical Resistant Tanks

When two or more of the above regulations are applicable, the more stringent requirement shall be met.

1.3 MANUFACTURER SUBMITTALS

A. **Shop Drawings;** The MANUFACTURER shall furnish shop drawings of all items and accessories with cost proposals. Three copies are required with prior to approval of the tanks. Shop drawings shall include detailed and certified design calculations by a registered engineer as specified above, bill of materials listing all components, resins, catalysts, promoters, ultraviolet light absorbers, agents, reinforcing materials, etc., with Manufacturer's name, trade and identification marks. The laminate sequence used for all tanks must either be attached to or included on drawings used by the fabricator's shop personnel.

B. **Data Requirements:** The shop drawings and data submitted shall include the following:

A. Dimensions.
B. Details of structural support members.
C. Equipment capacity (gallons).
D. Maximum design specific gravity.
E. Equipment weight, empty and filled with water.
F. Laminate sequence of construction and all materials of construction listed.

G. Specifications for all supplied bolting, gaskets and accessory items.
H. Screens

PART 2 -PRODUCTS

2.1 TANK DESIGN

A. Standards: Construction of tanks shall be in accordance with ASTM standards listed herein and other accepted industry standards for raceway tank design.

B. Design; Fiber glass tanks shall be constructed using. the contact molded method. Tank sidewall thickness shall have a continuous taper not made of stepped thickness courses.

C. Number - 28 identical tanks shall be provided with the dimensions shown in the drawings and specified herein.

D. Dimensional Requirements: See attached drawings.

2.2 MATERIALS OF CONSTRUCTION

A. Resin: Resin shall be manufacturer’s standard polyester resin, or approved equal. To insure that fresh resin is used, at the completion of the job, lot numbers of the resin used must be shipped with the completed tank. Fillers up to 2 percent by weight of thixotropic agent may be used for viscosity control in the paraffinated top coat on vertical surfaces, provided it will not interfere with visual inspection. The cure system used for the resin shall be in accordance with resin Manufacturer's current recommendations. Proper curing of the resin is the fabricator's responsibility. All products fabricated in this specification shall be poured to at least 90 percent of the minimum Barrel hardness specified by the resin Manufacturer. The requirement applies to both interior and exterior surfaces. No chemical-resistant surface, interior or exterior, shall be acetone sensitive. Where application of polyester film to prevent air inhibition of these surfaces is impractical, a wax containing resin Coating, formulated according to the resin Manufacturer's most recent recommendations, must be used. The minimum thickness of the polyester film shall be 4 mils. The outside surface of the tanks shall have a gel coat with color selection by the STATE OF UTAH ,

B. Reinforcement Chemical surfacing mat (veil) shall be Type C (chemical) glass, 10 mils thick, with a silane finish and a binder compatible with the lay-up resin. C-Glass shall be OCF M-514-236 or OCF M-514-234: Chopped strand mat shalt be Type E (electrical borosilicate) glass, 1-1/2 oz per sq ft, with silano finish and a styrenesoluble reactive binder. Continuous roving used in chopper gun for spray-up shall be Type E glass. Woven roving. shall be Type E glass, nominal 24 oz/sq yd, 4 by 5 weave, with silane-type finish. Continuous roving used for filament winding shall be Type E glass with a silane type finish.

2.3 CONSTRUCTION.

A. General: Tanks shall be contact molded on a highly polished monolithic male hold.

B. Laminate Construction: Laminate construction shall be as follows:

1. Chemical Resistant, Barrier: Tanks shall consist of an inner surface and an interior layer which constitutes the chemical-resistant barrier, and an exterior or structural layer. The inner surface shall be free from cracks and crazing, with a smooth finish. The resin-rich surface shall be between 0.010 and 0.020 inches and reinforced with C-glass. The resin rich inner surface (i.e. exposed to water) shall be a smooth highly polished gel coat, the resin to glass ratio should be approximately 90 percent resin and 10 percent glass. The interior layer shall consist of either (1)-3 layers of 1-1/2 oz / sq ft E-glass chopped strand mat, or (2)-2 layers of 1-1/2 oz / sq ft E-glass chopped strand mat followed by one pass by the spray-up process. In no case shall the combined thickness of the inner surface and the interior layer be less than 0.100 inches. The glass content for the interior layer shall be 20-30 percent,

2. Contact Molded Laminates: The contact molded process includes fabrication by the hand lay-up, contact pressure molding, and spray processes or combinations thereof, according to ASTM D 4907, except as otherwise noted. in addition, Inner surface and interior layer shall be constructed as specified in the preceding paragraph. The exterior layer or body of the laminate shall provide the additional strength necessary to meet the tensile and flexural requirements. Where separate layers such as mat or woven roving are used, all layers shall be lapped a minimum of one inch (two inches for woven roving). Laps shall be staggered as much as possible. If woven roving is used, a layer of chopped strand glass shall be placed as alternate layer. The exterior surface shall be relatively smooth with no exposed fibers or sharp projections. On laminates containing woven roving, cut edges exposed to the chemical environment shall be coated with resin, surfacing mat, and C-glass veil, and all machined flange faces shall be faced with C-glass.

3. Outer Surface: When air-inhibited resins are cured with an air-exposed surface, a wax-containing resin coating, formulated according- to the resin Manufacturer's most recent recommendations, must be used.

4. Tank Exposed Edges: The exposed edges on the top of the vertical sidewall of all tanks in the schedule above shall have a minimum of a 180 degree rounded edge with a minimum radius of 0.5 inches to prevent the Operators from getting skin scrapes or splinters when working around and over the tank side wail.

5. Tank Connections:

a. Plain End Connections. Where plain end connections are shown, ends shall be smooth with sufficient length to use a flexible connector and clamp.

6. Screens and Screen Embedments: The manufacturer shall provide the tanks with the screen embedments at intervals shown on the drawings. The embedments shall extend down the tank walls of the tanks with no embedment in the bottom of the tank. The screens once Inserted shall sit flush inside the embedment channel. There shall be no gap between the floor of the tank and the screen. The manufacturer shall provide one screens per tank. The screens shall be 1/8” diameter perforated aluminum. When the screens are inserted into the full tank, there shall be no open gap through which fish fry may swim; rather the full wetted perimeter of the screen shall sit inside the embedments.

7. Standpipe Drainage: Said tanks shall be equipped with standpipe arrangements as shown on the drawings. When a standpipe for a tank is inserted into the standpipe coupling, flow shall be sealed. The standpipe coupling shall drain to a 4-inch long (minimum) section of hard piped schedule 80 PVC piping for attachment to flexible tubing or boot.

8. Double Walled and Insulated; Tanks shall be constructed with double walls for structural reinforcement. The space between the double walls shall be insulated.

2.4 WORKMANSHIP

A. Tank Deflection: The tanks shall be constructed such that there is less than a 1/8" deflection of the tank walls for a full tank.

B. Visual Defects: ASTM D2563 shall be used for quality control of both filament wound and hand. lay-up construction. Acceptance levels shall be as follows:

Process Surface:	**Defects:**
Blisters	None
Burned Areas	None
Chips	None
Cracks	None,
Crazing	None
Try Spots	None
Entrapped Air	None at surface. If in laminate 1/16-in dia. max • and 5/sq in max.
Exposed Glass	None
Exposed Cut Edges	None
Foreign Matter	None
Pits	Max 1/16-in dia X 1/32-in deep, max 10/sq ft.
Scratches	None (coated)
Surface Porosity	None
Wrinkles	Max deviation 10 percent of wall thickness.
Sharp Discontinuity	None

Non-Process Surface:	**Defects:**
Blisters	Max 1/4-in X dia 1/16-in high,
Burned Areas	None
Chips	Max 1/4-in with max thickness of 20 percent of wall
Cracks	None
Crazing	Slight
Dry Spots	Max 2 sq in/sq ft
Entrapped Air	1/8-in dia max; no more than 3 percent of area.
Exposed Glass	None
Exposed Cut Edges	None
Foreign Matter	None if it affects the properties of laminate.
Pits	Max 1/8-in dia X 1/16-in deep.
Wrinkles	Max deviation 20 percent of wall thickness, but not exceed 1/8-in.
Scratches	None (coated)
Surface Porosity	None
Sharp Discontinuity	None

If the area fails to meet the requirements of entrapped air or voids in less than 40 percent of the total surface, those areas may be repaired and reinspected, If the defective areas exceed 40 percent of the total surface, the entire vessel shall be rejected.

2.5 BOLTS, ANCHOR BOLTS, WASHERS, SUPPORTS, AND HOLD DOWN LUGS

A. The CONTRACTOR shall provide all bolts, anchor bolts, nuts, washers, and supports as required for all the plastic and fiber glass items specified in this Section, and in accordance with the requirements of the Manufacturers of the plastic and fiber glass items. All bolts, anchor bolts, washers, hold down lugs, and supports required in connection with the plastic or fiber glass items provided under the Section shall be of Type 304 or 316 stainless steel.

2.6 ACCEPTABLE MANUFACTURERS

A. Reiff Manufacturing Inc., Walla Walla, WA; (509) 525-1081;

B. Gemini Plastics, Golden, Colorado; (303) 278-0033

C. Red Ewald, Inc; Karnes City, TX; (512) 780-4272

PART 3

Not used.

END OF SECTION